DEVELOPING PRINCIPLES AND SCHEMATA FOR INTERVENTION SET SELECTION IN HUMAN PERFORMANCE TECHNOLOGY

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May 13, 2015

Dedicated to my daughter Maui Ade,

my husband Omotara, and

my parents Margaret and Gary

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To my mother, you have been my rock throughout my life. Your perseverance, dedication, fortitude, and love have made me the woman I am today. I remember sitting outside your night classes as a child, then you coming home to cook dinner and make sure my homework was completed. You have been an inspiration when times get tough. To my father, thank you for teaching me the importance of balance in my life. Your practicality, strength, and gentleness have made me a wiser person. Mommy and Daddy, I love you both. Your nurturing allowed me to explore the world and my imagination with a fearless sense of adventure. Your combined love makes the ultimate intervention set.

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Simone G. Symonette

DEVELOPING PRINCIPLES AND SCHEMATA FOR INTERVENTION SET SELECTION IN HUMAN PERFORMANCE TECHNOLOGY

For profit, non-profit, and government organizations that have an interest in improving performance, intervention set selection is a key component. As a result, consultants seek guidance on how to select intervention sets that create meaningful results for the organizations they serve. In response to the gaps in the literature related to intervention selection, this research adheres to a grounded theory method of inquiry to better understand the process of intervention selection as part of the human performance technology process. The following questions were answered through this research:

1. How do practicing performance improvement professionals select interventions?
2. Are there discernable patterns that practicing performance improvement professionals follow when selecting interventions?
3. Are there principles that guide intervention selection?
4. Are there elements involved in designing interventions that are schematic?
5. Is there an underlying theory or model that can be developed that explains intervention selection, including specific relationships between performance factors? If so, what is the theory and does it inform intervention selection?

The 15 principles generated in this study serve as conventions that guide professionals on how to select an intervention set. The principles explain how and why certain actions happen during the intervention set selection phase and they function as a guide for practitioners when selecting intervention sets. The development of this study's schemata, that consists of *composition*, *directional dependence*, *mechanism of action*, *enforcement*, *transformation*, and *reverberation* adds new knowledge to the field of performance improvement. Identifying these factors explains a practitioner's behaviors when selecting an intervention set. The schemata also help to illustrate the art and science inherent in intervention set selection. The value of a set is to create the most comprehensive intervention in order to assure successful human performance. The study concludes with a presentation of the substantive theory of intervention set selection.

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I. INTRODUCTION

Profit, not-for profit, and government organizations all have one thing in common, the need to improve performance at the worker, process, and organization levels. According to Gilbert (1978, 2007) performance (P) is the result of behaviors (B) by performers that produce accomplishments (A), or P = B → A. Understanding this seemingly simple equation and its various adaptations has helped to improve performance in countless organizations (Binder, 1998). However, understanding what combination of interventions will influence behaviors in a desired direction and improve performance is not simple, nor is it easily understood by researchers or practitioners in the field of human performance improvement (Langdon, Whiteside, & McKenna, 1999). An intervention is defined as "a course of action taken to improve performance. It is planned and purposeful, and requires organizations and the people in them to behave differently" (Pershing, 2006, p.12).

Langdon, Whiteside, and McKenna (1999) suggest that gaps in performance can be reduced or closed through the proper selection of interventions. According to Spitzer (1992), "What differentiates human performance technology (HPT) from other fields, such as training and organizational development, is its unique approach to performance problem solving" (p. 114). This distinctive problem solving approach revolves around key attributes a performance technologist should aspire to; these include the ability to

select interventions that are results-oriented, cost-effective, comprehensive, and systemic (Pershing, 2006; Spitzer, 1992).

Although intervention selection is a critical aspect of HPT, understanding how to properly select interventions is not so easily understood because it is not clearly explained in the field's most prominent models and literature. As Langdon, Whiteside, and McKenna (1999) clearly state:

> Intervention selection is no easy matter. At its worst, it means selecting and using only those interventions known to the performance technologist, which might lead to an improvement project that misses the mark. At its best, intervention selection involves conducting an accurate and complete performance analysis, identifying what change is needed, determining the exact kind of change that is needed and at what level, knowing about and selecting the best available interventions, and implementing the change by working with others who also conduct interventions. (p. 24)

The process of intervention selection is described in the literature as, "The process of choosing the appropriate action that will reduce/close the gap between desired and actual performance" (Jang, 2008, p. 24). Even though the terms *intervention* and *intervention selection* are articulated in the literature, they are a bit misleading because most performance problems require more than one intervention to reduce or close the gap (Stolovitch & Keeps, 2006; Rothwell, 1996; Langdon, Whiteside, & McKenna, 1999). Broad (2006) states that "a combination of interventions is necessary to lead to desired performance and results" (p. 325). Although scholars mention the idea of combinations or multiple interventions, there is limited evidence to support this idea. Also, many organizations often only prescribe one intervention, training, as a remedy to address performance. In order to add to the research literature and the knowledge of practitioners, this dissertation focuses inquiry on how consultants

select multiple interventions that work together to close or reduce performance problems.

Problem Statement

Knowing how to appropriately choose a course of action or intervention requires an understanding of how theory explains the possible outcomes of multiple performance factors working in unison. Unfortunately, in the field of HPT there is limited theory and schema explaining how intervention selection occurs. Practitioners have typically used experience and models as a basis for intervention selection; however, this approach does not allow the field to move forward (Pershing, Lee, & Cheng, 2008; Bichelmeyer & Horvitz, 2006). One reason for this has to do with the lack of information provided in HPT models, given that these models typically gloss over the topic of intervention selection without explaining how the selection process occurs. Understanding the theory behind why an intervention should be selected not only reduces the possibility of unexpected results, but also allows an individual to better explain why a course of action should be taken from a theoretical perspective that can be tested.

Scholars in the field seem to avoid identifying the strategic and conscious efforts involved in selecting multiple interventions. In the *Handbook of Improving Performance in the Workplace Volume 2: Selecting and Implementing Intervention*, Watkins and Leigh (2010) refer to intervention selection as a part of a "comprehensive improvement system" (p. 319). This suggests that there is a process involved in "…linking together interventions, such as performance measurement systems and managerial coaching, with effective interventions for

addressing elements of motivation, culture, knowledge and skill, and other components of the Pyramid…" (Watkins & Leigh, 2010, p. 319). This linking process is needed in order to improve an organization at "…multiple levels of performance (results)" (Watkins & Leigh, 2010, p. 320). Even though Watkins and Leigh mentioned the concept of linking together interventions, they provide no guidance on how the process is conducted, why interventions complement one another, and how the interventions work together and not individually to improve performance.

In their attempt to shed light on the mystery of intervention selection, Watkins and Leigh (2010) chose the Performance Pyramid (1998) as the "organizing framework" for Volume 2 of the *Handbook of Improving Performance in the Workplace,* which is designed to address selecting and implementing performance interventions. Wedman (2010) notes, "The Performance Pyramid is a conceptual framework for analyzing performance problems and a tool for identifying (albeit at a high level) performance improvement interventions" (p. 51). However, the pyramid and the handbook do not yield any new ideas on selecting multiple interventions, other than briefly mentioning the concept of a "comprehensive improvement system" (Watkins & Leigh, 2010, p. 319). Although not empirically validated, the performance pyramid has been available to practitioners in the field since its inception in 1998 (Wedman, 2010). The pyramid simply reverts to forcing the user to rely on their practical experience, vague models, and simple heuristics in order to navigate the murky waters of intervention selection. There is a need for more empirically validated ideas on

intervention selection in order for the field to move forward. In chapter 2, the literature review, this gap in the field's knowledge base is examined in more detail.

The relationship between performance analysis and intervention selection is one that is deeply rooted in the performance improvement literature and is discussed in this dissertation as well. Scholars suggest that the appropriate intervention becomes self-evident once a well thought out cause analysis is completed (Sanders & Thiagarajan, 2005; Robertson, 2004; Van Tiem, Mosely & Dessinger, 2004; Langdon, Whiteside, & McKenna, 1999). Although performance analysis is the cornerstone of performance improvement, it has not eclipsed topics related to interventions in the literature. According to Jang (2008) in the dissertation titled "Themes and issues as reflected in human performance technology literature: A content analysis", the most frequently discussed topic in *Performance Improvement* and *Performance Improvement Quarterly* centered on intervention design. However, there is limited research focused on understanding intervention selection. There is even less research focused on how interventions complement each other. This lack of focus on these topics may be due to the perceptions in the field that intervention selection is an art, as Rothwell (1996) claims in stating that intervention selection "is more of an art than science, so there is no precise way to do it" (p. 200). Although there may be some truth to this claim, it has not yet been validated. Thus scholars should continue to strive to reveal the scientific elements of the selection process, which is the goal of this dissertation using a grounded theory approach.

Purpose and Research Questions

This research is a response to the gaps in the literature of human performance improvement related to intervention selection. This research will adhere to a grounded theory mode of inquiry to better understand intervention selection. The purpose of the study is to explore the schema related to the selection of interventions. The following questions will be answered through the efforts made in this research study:

- How do practicing performance improvement professionals select interventions?
- Are there discernable patterns that practicing performance improvement professionals follow when selecting interventions?
- Are there principles that guide intervention selection?
- Are there elements involved in designing interventions that are schematic?
- Is there an underlying theory or model that can be developed that explains intervention selection, including specific relationships between performance factors? If so, what is the theory and does it inform intervention selection?

Significance

This study contributes to the field of performance improvement by investigating intervention selection. The results of this exploration will significantly impact the field through 1) development of theory, 2) setting a foundation for future inquiry, 3) providing a guide for the practical application of models and

principles, and 4) unearthing a method to which performance technologists may adhere in order to demonstrate the value of their knowledge and expertise.

Theory Development

According to the *Report of the 1999 ISPI Symposium Appropriate Inquiry in Human Performance Technology* by Brenda Sugrue and Harold Stolovitch (2000), several leading scholars stressed the need for theory building in the field of performance improvement. Richard Clark recommended that HPT scholars "look to other fields in order to develop an integrated theory based on a synthesis and reconciliation of the most valid and generalizable theories in three areas: knowledge, motivation, and organizational development" (p. 34). Rob Foshay suggested that "theory building and research in the field should concentrate [on]: organizational development and training and knowledge management" (p. 35). A final theory-building suggestion came from Richard Swanson who recommended that researchers "should develop a unique integrated theory of human performance" (p. 35).

Acting on the recommendations to develop theory in the field, this research will focus its theory-building efforts on intervention selection by developing a schema that encompasses such a theory. It will begin building a theoretical explanation for the relationship between documented performance improvement factors that function as a group of interventions. It will provide a clarification on how to appropriately select interventions that complement each other within a group. It will provide a rationale for the selection of various

combinations of interventions that include skill and knowledge as well as other factors.

Foundation for Future Inquiry

This study further advances the field by building a theoretical foundation for future inquiry on intervention selection. The ultimate goal of performance improvement is to understand not only what performance factors improve performance but also how the factors complement each other to bridge performance gaps. According to Pershing (2006):

> From the beginning, systematic inquiry, including research and evaluation, has been the genesis for new ideas in HPT. Early on, the dominant paradigm for inquiry was studies that focused on *proving* that specific interventions were effective ways to improve individual and organizational performance. Today, the performance technology researcher and evaluator have added other paradigms or ways of looking at and approaching research and evaluation. (p. 9)

Following this new approach, this research study explorers ideas linking organizational systems, incentives, cognitive support, training, tools, physical environment, and inherent ability as intervention sets. Rothwell and Sredl (1992) state:

> *Systematic investigation*-another term for *research*-is essential to finding, testing, or applying new ways to improve human performance. It is a starting point for performance improvement. Without such research, HRD professionals would be unable to determine “what works” and “what does not work” to improve human performance and productivity in organizations. (p. 1)

Future investigation is needed on the topic can focus on the multiplying effect of proper intervention selection, or what Gilbert (1978, 2007) refers to as

the diffusion of effect. Even more intriguing, inquiry could center on the human capital and financial cost of selecting interventions that are theoretically unsound.

Guidance for Practical Application

The following literature review demonstrates how prominent models in the field overemphasize particular elements of the performance improvement process while paying little attention to the selection of multiple interventions. When one examines these models, it becomes evident that this lack of clarification in the area of intervention selection is problematic because there is no explanation of how to select multiple interventions and why. Rothwell and Sredl (1992) state, “Preparing a model is a creative activity. The modeler is free to borrow parts from different theories and exclude whatever might be irrelevant to the purpose. For this reason, models are usually only partial representations of reality” (p. 21). This dissertation begins to close the gaps in the literature related to intervention selection in performance improvement process models.

Value Added Through Systemic Select of Intervention Sets

Realizing and articulating the value one’s work contributes to an organization is a powerful skill. However, this realization cannot be fully actualized if performance technologists in the field do not first better understand the importance of systems thinking, and more specifically the triggering effect one intervention has on another within an organization setting. By focusing too much energy on the effects of one intervention, the value of the intervention in its

entirety is diminished. Oftentimes, consultants simply conduct cost benefit analysis of one intervention, without truly understanding the impact that interventions working together have on an organization. Gilbert (1978, 2007) noted that the worth of an intervention is the value received from the intervention minus the cost of the invention. The efforts made in this dissertation allow performance consultants to better articulate the worth of their interventions in selecting a well harmonized group of interventions, thus contributing to their individual practice and the overall growth of the field of human performance technology.

Defining Intervention Selection

Intervention selection is undeniably significant to the field of HPT, as it is clearly mentioned in the field's definition as a fundamental process. ISPI (2015) defines HPT as:

> …a systematic approach to improving productivity and competence, uses a set of methods and procedures -- and a strategy for solving problems -- for realizing opportunities related to the performance of people. More specific, it is a process of selection, analysis, design, development, implementation, and evaluation of programs to most cost-effectively influence human behavior and accomplishment. It is a systematic combination of three fundamental processes: performance analysis, cause analysis, and intervention selection, and can be applied to individuals, small groups, and large organizations. (¶ 1)

Jang (2008) more precisely describes *intervention selection* as "The process of choosing the appropriate action that will reduce/close the gap between desired and actual performance" (p. 24). Sanders and Thiagarajan (2005) simply suggest that intervention selection is the next step after root cause analysis.

This literature review begins with an analysis of the word *intervention* as it is articulated by HPT scholars. The word *intervention* comes from the word *intervene,* which originated from the Latin word *intervenire* meaning “to come between” (“Intervention*”*, n.d). Table 1, *Definitions of Intervention,* provides five different descriptions of the word *intervention* as it is used throughout HPT literature. Based on the definitions provided, there are two key characteristics that define an intervention: 1) its ability to function as an instrument or mechanism, and 2) its ability to be a factor that is consciously or intentionally used to induce change.

The first distinctive quality of an intervention, as it is used in HPT terminology, is that it is an instrument or mechanism for accomplishing a desired result as suggested by the various definitions provided in Table 1. Langdon, Whiteside and McKenna (1999) states that an intervention is “Any means used to bring about change…” (p. 2). Stolovitch and Keeps (2006) refers to an intervention as a tool for building. While Pershing (2006) refers to an intervention as something that is “…designed and developed to respond to specific needs…” (p. 13). The second defining characteristic of an intervention centers on its intentional use or function to bring about change, as the definitions in Table 1 reflect.

Table 1:
Definitions of Intervention

Author	Definition
(Argyris, 1970)	"To intervene is to enter into an ongoing system of relationship, to come between or among persons, groups, or objects for the purpose of helping them. There is an important implicit assumption in the definition that should be made explicit: the system exists independently of the intervenor. These reasons my range from helping the clients make their own decisions about the kind of help they need to coercing the clients to do what the intervenor wishes them to do" (p.15).
Rothwell (1999)	"A long-term, evolutionary and progressive change effort" (p.89).
Langdon & Whiteside, (1990) (As cited by Langdon, 1999)	"Any means used to bring about a change in performance in an individual, work group, process, or business unit with the expressed purpose of establishing, improving, maintaining, or extinguishing that performance from an existing to a more desired state" (p.2).
Van Tiem, Mosely & Dessinger (2004)	"Interventions are deliberate, conscious acts that facilitate change in performance" (p.63).
Sanders & Thiagarajan (2005)	"In HPI terminology, an intervention is a combination of tools and techniques that is clearly and directly related to performance gaps" (p.ix).
Stolovitch & Keeps (2006)	"A deliberately conceived act or system specifically designed to bridge the gap between current and desired performance states. It can be complete unto itself or part of a basket of interventions. It is strategically applied to produce intended performance results. An intervention may add a performance support element or may remove an obstacle that prevents performance from occurring" (p. 231).
Pershing (2006)	"An intervention is a course of action taken to improve performance. It is planned and purposeful, and requires organizations and the people in them to behave differently. Interventions have to be proactively planned for and managed, and people must adapt to them. Interventions are designed and developed to respond to specific needs, which are gaps between where an organization is and where it seeks to be in the future" (p. 12-13).

Stolovitch and Keeps (2006) state that an intervention is, “A deliberately conceived act or system specifically designed to bridge the gap between current and desired performance states” (p. 231). On the same line, of thought, Van Tiem, Mosely and Dessinger (2004) describe interventions as “…deliberate, conscious acts that facilitate change” (p. 63). While Langdon, Whiteside and McKenna (1999) refer to an intervention as having an “…expressed purpose of establishing, improving, maintaining, or extinguishing that performance from an existing to a more desired state” (p. 2). Pershing’s (2006) definition expresses this intentional change characteristic in its entirety by stating that:

> An intervention is a course of action taken to improve performance. It is planned and purposeful, and requires organizations and the people in them to behave differently. Interventions have to be proactively planned for and managed, and people must adapt to them. (p. 12-13)

Since there are many different interventions one can choose from to serve as an intentional change mechanism for performance improvement, it is necessary to examine what is meant by selection. Selection is defined as:

> 1. An act or instance of selecting or the state of being selected; choice. 2. A thing or a number of things selected. 3. An aggregate of things displayed for choice, purchase, use, etc.; a group from which a choice may be made: *The store had a wide selection of bracelets.* (Dictionary.com online dictionary, 2010)

The definition of selection implies that there are an assortment of things (interventions) to choose from and that one, or more than one of these things (interventions) are chosen over others because of some defining characteristic that makes it more favorable than the others for achieving a particular result.

II. LITERATURE REVIEW

Before schemata, principles, and subsequent theory were developed for intervention selection, it necessary to conduct an in-depth review of the human performance technology (HPT) literature. This review begins with an examination of the prominent performance improvement models. Diagnostic, process, and holistic models are examined in order to clearly demonstrate the lack of guidance in the literature on how to select an intervention set immediately following the analysis phase. Ideas surrounding systemic thinking and the theory of diffusion of effect are observed to the development of a theoretical framework for how consultants select interventions. However, these concepts are deficient and do not provide a clear and comprehensive view of the overall process. An evaluation of principles and heuristics, or “rules of thumb,” related to the selection of intervention sets are reviewed in order to illustrate where the gaps in the knowledge base exist. The literature review concludes with a summary of the voids in the literature regarding intervention selection and the rationale for this study.

Prominent Models in the Field

Watkins and Leigh (2010) state:

> Models, frameworks, and taxonomies alone, however, are not enough to make the challenging decisions about what do in order to improve human and organizational performance. There are no formulas for determining which interventions will achieve desired results within your organization. (p. 75)

Langdon, Whiteside, and McKenna (1999) assert that the field of performance improvement currently lacks a clearly articulated process for intervention selection. Rothwell (1999) argues that it is difficult to provide a detailed explanation for intervention selection when most performance problems are caused by a variety of factors and require more than one intervention to reduce the gaps in performance. These claims are some of the reasons why scholars in the field of performance improvement need to expand their thinking around intervention selection. When one examines models in the field of performance improvement, it becomes evident where the lack of explanations about the process of intervention selection occur. As this section of the literature review reveals, scholars need to develop a schema or framework for intervention selection to fill the present void on the topic in HPT models.

For scholars in HPT, models are a "useful technique for describing a new concept, idea, or process" (Rosenberg, Coscarelli, & Hutchison, 1999, p. 36). Models in HPT literature are used to describe almost every part of the performance improvement process, some better than others. Wilmoth, Prigmore, and Bray (2002) claim, "The ability to visualize and then communicate the process logic to others will be the true measurement of any HPT model's

effectiveness and suitability for use" (p. 16). What are models? What role do they play? According to Rothwell and Sredl (1992):

> A *model* is a simplified representation of an object, process, or phenomenon. It can only be proven accurate and, unlike theory, cannot be proven wrong with finality. It dramatizes key features of that which it depicts, but also unlike theory, it cannot explain underlying causes. In short, a model can help to conceptualize a phenomenon but can rarely help to explain why it occurs…Preparing a model is a creative activity. The modeler is free to borrow parts from different theories and exclude whatever might be irrelevant to the purpose. For this reason, models are usually only partial representations of reality. (p. 20-21)

Models play a critical role in the practice of HPT because they allow the "individual when looking at any complex activity, to conceptualize a myriad of causal relationships and chart them in some manner that can be communicated to others" (Wilmoth, Prigmore & Bray, 2002, p. 16).

Performance improvement models are divided into three categories: diagnostic models which focuses on where to search for problems, process models which focuses on how to examine a problem once identified, and holistic models which provide an integrated approach to viewing a performance problem (Wilmoth, Prigmore & Bray, 2002; Rosenberg, Coscarelli & Hutchison, 1999). In order to illustrate the gaps in knowledge concerning intervention selection, an examination of the field's most prominent *process* models is conducted in this review. To show how performance factors are related to intervention selection, this section of the literature review also includes an assessment of Wile's (1996) diagnostic model. Wile's model provides "the most current and comprehensive performance equation" (Bichelmeyer & Horvitz, 2006, p. 1167). Wile's original model is informed by HPT scholars including Gilbert (1978/2007); and Harless

(1970). It also served as an inspiration for other scholars, such as Gilmore (2009), as they sought a deeper understanding of performance factors. The review also examines the latest version of the Performance Pyramid (2010) by John Wedman which is used as the structure for Watkins and Leigh's (2010) Handbook of Improving Performance in the Workplace Volume 2: Selecting and Implementing Performance Interventions. This section of the review concludes with an explanation of holistic models and their potential value for the development of a schema for intervention selection.

Process Models

According to Wilmoth, Prigmore, and Bray (2002) process models are "models that go beyond the diagnostic activities of determining where to look for performance problems and begin to show us how to examine the problem itself" (p.20). It is the "how to" aspect of these models that make them of great value to practitioners. In their description of process models, Wilmoth, Prigmore, and Bray (2002) identify characteristics that make process models unique:

> As stated above, most models in this group are linear or sequential. In addition, they often have phased or grouped activities, are driven by a gap analysis, are intervention oriented, and usually contain a feedback mechanism. All five characteristics will not be present in every process model, but all of the models will have some of these traits in common. (p. 20-21)

This review of prominent process models reveals that it is the relationship between analysis and the selection of an intervention set that is unclear. Langdon, Whiteside, and McKenna (1999) state, "Good intervention selection begins with good performance analysis. If you do not accurately and completely

define the performance gap, you cannot hope to select all the needed interventions" (p. 15). This statement begs a bigger question, which is what guidance is provided in the process models to help one select an intervention set? In order to demonstrate this problem, a few well known process models in the field will be examined. These process models include:

- HPT/ISPI Model (Van Tiem, Moseley, & Dessinger, 2004)
- Performance Analysis Flow Chart (Mager & Pipe, 1984)
- Strategic Impact Model (Molenda & Pershing, 2004, including Wile's diagnostic model)

HPT/ISPI model

Since the International Society for Performance Improvement (ISPI) model is considered "an appropriate example of a process model," it will be examined first (Wilmoth, Prigmore & Bray, 2002, p. 21). According to Van Tiem, Moseley, and Dessinger (2004):

> The original HPT Model was developed by Deterline and Rosenberg and published by ISPI to illustrate the steps needed to function as a PT practitioner and accomplish performance improvement in the workplace. The model defined performance analysis, cause analysis, and intervention selection and design. Intervention implementation and evaluation were identified but not defined. (p. 6)

Figure 1 shows that the HPT model begins with analysis, starting with performance, then cause analysis. The idea that intervention selection immediately follows analysis is seen throughout HPT process models.

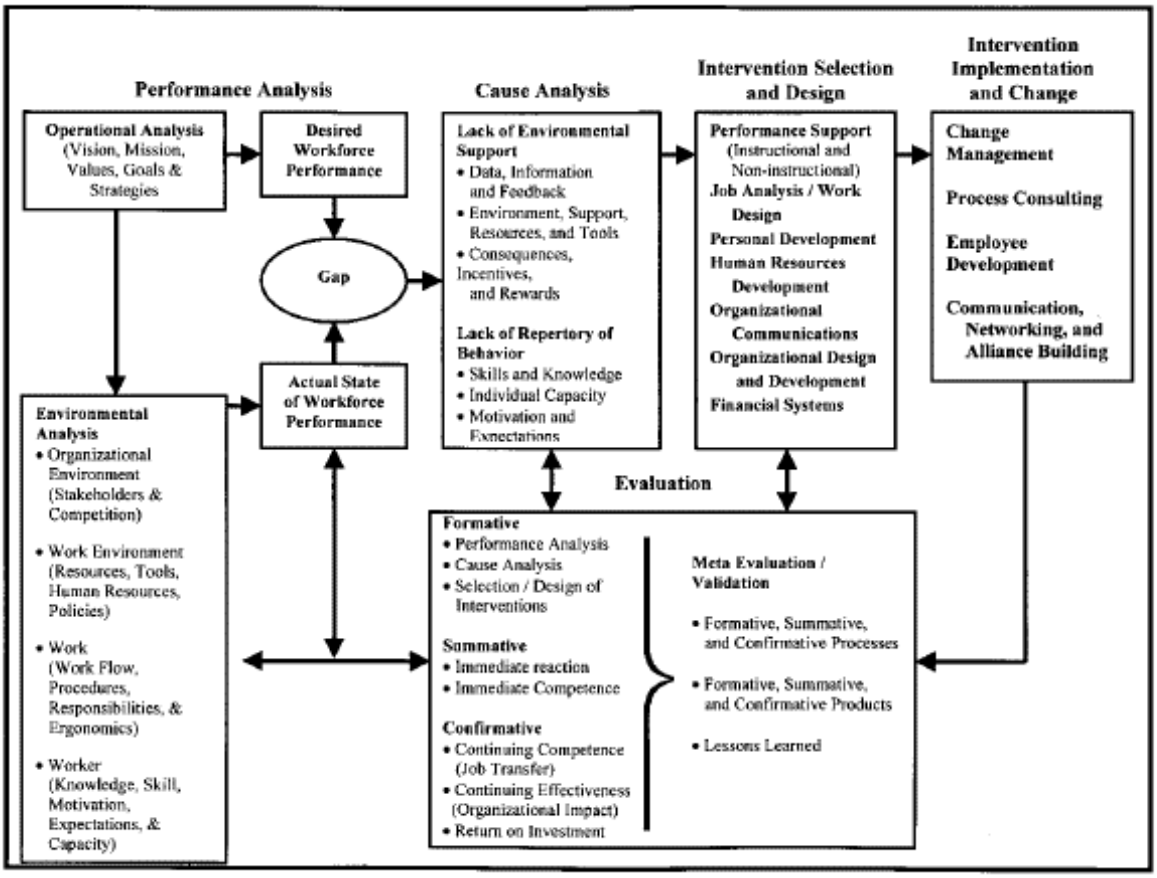


Figure 1: HPT/ISPI Model

From, Van Tiem, D. M., Moseley, J. L., and Dessinger, J. C. (2004). *Fundamentals of performance technology.* Washington, DC: International Society for Performance Improvement.

As Van Tiem, Moseley, and Dessinger (2004) state:

> There is no possibility of a chicken-or-egg paradox when it comes to performance analysis. Without first identifying and clarifying the problem or performance gap, it is unsound (and certainly unsystematic) to state the cause and select or design a solution. (p.22)

Van Tiem, Moseley, and Dessinger go on to say that the selection of interventions will “flow smoothly from detailed performance and cause analysis” (p.64). The authors argue that it is the practitioner’s basic knowledge of different

types of interventions that is critical when selecting, but offer no advice on how interventions work together as one entity or a set. These authors provide a job aid called the intervention selector as a guide to the selection process to accompany the HPT model: this guide is only a list and does not help the user prioritize possible interventions, and is not helpful in understanding the process of selecting intervention sets because no direction is given on how selections are made. For example, there is no explanation provided that links the *Cause Analysis* box in the HPT model with the *Intervention Selection, Design, and Development* box. The user is supposed to simply rely on the results of the analysis to select an intervention. Wilmoth, Prigmore, and Bray (2002) state, "The ISPI and human performance models show a direct cause-and-effect relationship between a performance problem and the intervention" (p. 21). These models lack clarity on the connection between cause analysis and selection. In fact it contradicts Gilbert's (1978/2007) suggestion to avoid one-to-one relationships between the problem and the intervention. The HPT/ISPI model does highlight the overall process of performance improvement; however, the question still remains how interventions as a group should be selected.

Strategic impact model

Molenda and Pershing's (2004) *Strategic Impact Model* has the same lack of clarity as the ISPI model in respect to intervention set section (See Figure 2).

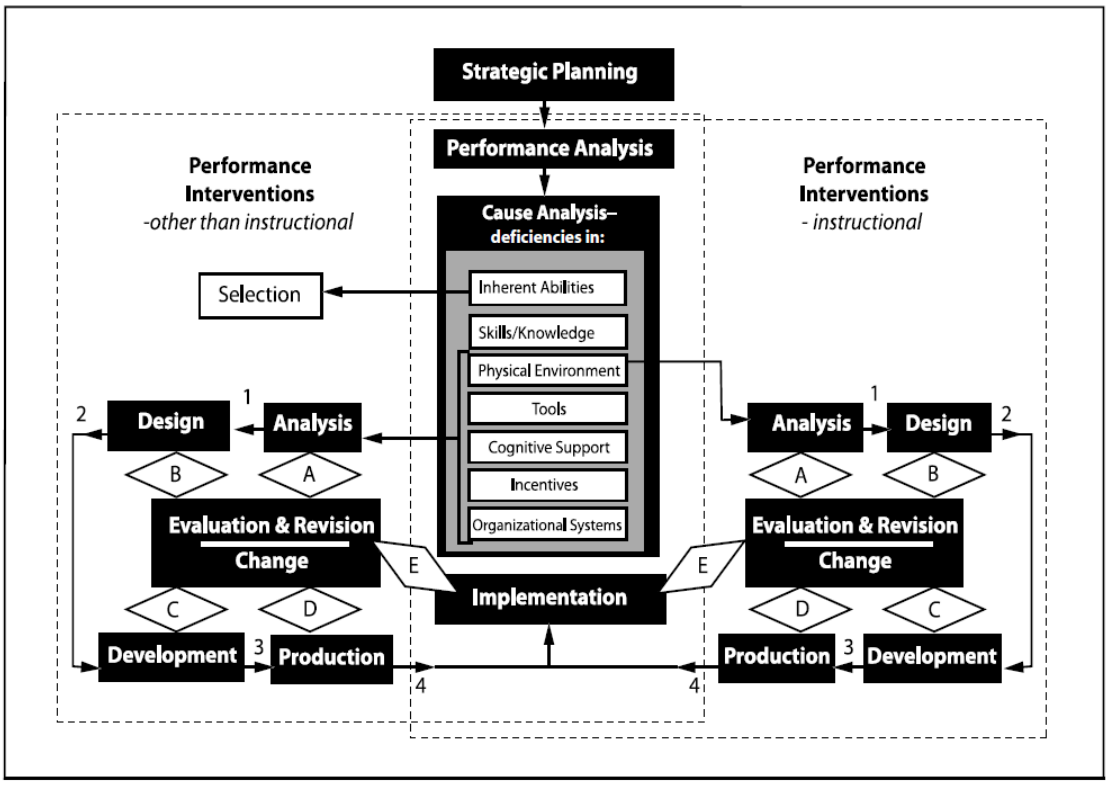


Figure 2: Strategic Impact Model

From, Molenda, M., & Pershing, J. A. (2004). The strategic impact model: An integrative approach to performance improvement and instructional systems design. *TechTrends, 48*(2), 26-32.

Although the scholars do acknowledge that, “the goal should be improvement of human performance, which could best be accomplished by combining instructional interventions with non-instructional interventions,” their model does not explain how the combining of interventions takes place (Molenda & Pershing, 2004, p. 26). Instead their explanation of the model leads one to think that interventions should be selected in a one-to-one ratio to match the causes of performance problems. Molenda and Pershing (2004) state:

> …deficiencies traced to shortcomings in inherent ability can be addressed by selecting different workers, ones who have the potential to perform as needed. Deficiencies traced to skill and knowledge deficits can be addressed by developing instructional materials and systems. Other

> sources of deficiency can lead to other specific types of instructional or noninstructional interventions. However, all of them need to be created before they can be implemented. (p. 29)

The strength of this model lays in its ability to illustrate "how these different causes and interventions, in combination, can be developed and implemented in an integrated fashion, accompanied by timely change-management activities" (Molenda & Pershing, 2004, p. 29). This model assumes, like many other models in HPT, that intervention selection is easily achieved after the performance analyses are completed, and emphasizes feasibility and cost effectiveness more in the selection stage than the effect of the results.

Mager and Pipe's (1984) performance analysis flow chart

Mager and Pipe's (1984) Performance Analysis Flow Chart serves as a "guideline for identifying and solving performance problems" and should not be taken literally (Wilmoth, Prigmore & Bray, 2002, p. 18, Mager & Pipe, 1997). As a well-known model in the field, it has a powerful impact on the way in which practitioners, particularly novices, view performance problems. Therefore, it is important that the model be examined in terms of intervention selection. Mager and Pipe position this model as a tool that practitioners can use to educate clients about other possible performance factors when clients approach HPT practitioners with the statement: "We think we've got a training problem" (Mager & Pipe, 1997, p. 7). The frequency with which this situation occurs is why Mager and Pipe begin the decision making algorithm with deciding whether or not the problem is important to the organization and then follow immediately with a

decision about whether or not the problem is a skill deficiency which requires training. See Figure 3.

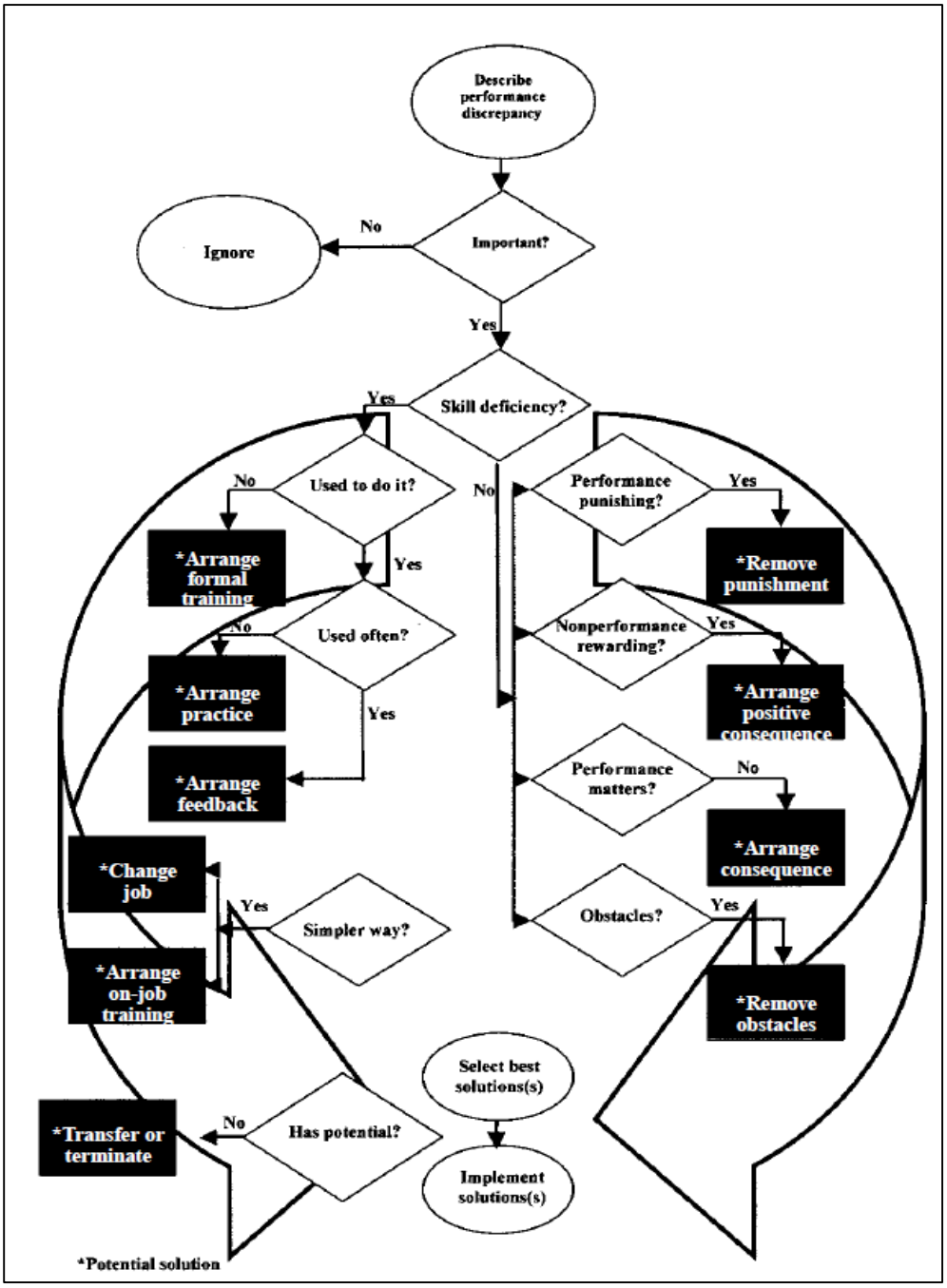


Figure 3: Mager and Pipe's (1984) Performance Analysis Flow Chart

From, Mager, R., & Pipe, P. (1984). *Analyzing performance problems*. Belmont, CA: Pitman Management and Training.

Although the structure of the model is designed to be practical in terms of how real life situations unfold between HPT consultants and clients, it is misleading to novice practitioners who do not understand how other higher order performance factors work in relation to training. For example, Gilmore's (2009) analysis of exemplary cases in HPT indicates that organizational systems are typically the primary issues influencing performance, the second most frequent are incentives, followed by training. Mager and Pipe's model, like other HPT models, provides a one-to-one ratio of cause to intervention. Rosenberg, Coscarelli and Hutchison (1999) state:

> Mager and Pipe (1984) relate specific interventions to the outcomes of performance analysis. Their model uses a decision-tree format whereby specific interventions are tied to corresponding yes-or-no questions. Mager and Pipe's model is primarily a tool for determining the best intervention to use in removing a discrepancy between actual and desired performance. (p. 38)

In terms of intervention selection, Mager and Pipe's (1984) model provides little guidance on how to go about selecting "best solution(s)". The only criteria Mager and Pipe (1984) provide for evaluating interventions are that the interventions be cost effective, practical, and feasible. Setting aside these obvious concerns that must be addressed, there is little to no guidance on how to select interventions as a set based on a theoretical understanding of the interventions working together as a set, or the effectiveness of the set in addressing the performance issue.

Diagnostic Models

The very nature of diagnostic models does not make them appropriate models for explaining how intervention sets are selected. Diagnostic models are different from process models in that they inform the user on "where HPT *can* be applied" whereas process models demonstrate "*how* HPT can be applied" (Wilmoth, Prigmore & Bray, 2002, p. 19). Although current diagnostic models may not show the process of selection, three are placed under review in this dissertation because they provide valuable insight on ideas that can inform the development of an intervention selection schema. The diagnostic models that will be reviewed in this section of the literature review include:

1. Refined Wile's (1996) by Gilmore (2009). See Figure 4.
2. Externality-Tangibility (E-T) Model of Human Performance. See Figure 5.
3. Performance Pyramid (Wedman, 2010). See Figure 6.

Wile (1996) provides insight into what elements or factors drive human performance. Wile's diagnostic model is an amalgamation of various HPT models and the elements necessary to bring about desired human performance (Wile, 1996; Bichelmeyer & Horvitz, 2006; Gilmore, 2009). Wile (1996) identifies the following performance factors 1) organizational system 2) incentives 3) cognitive support 4) tools 5) physical environment 6) skill and knowledge and 7) inherent ability.

Refined Wile HPT model

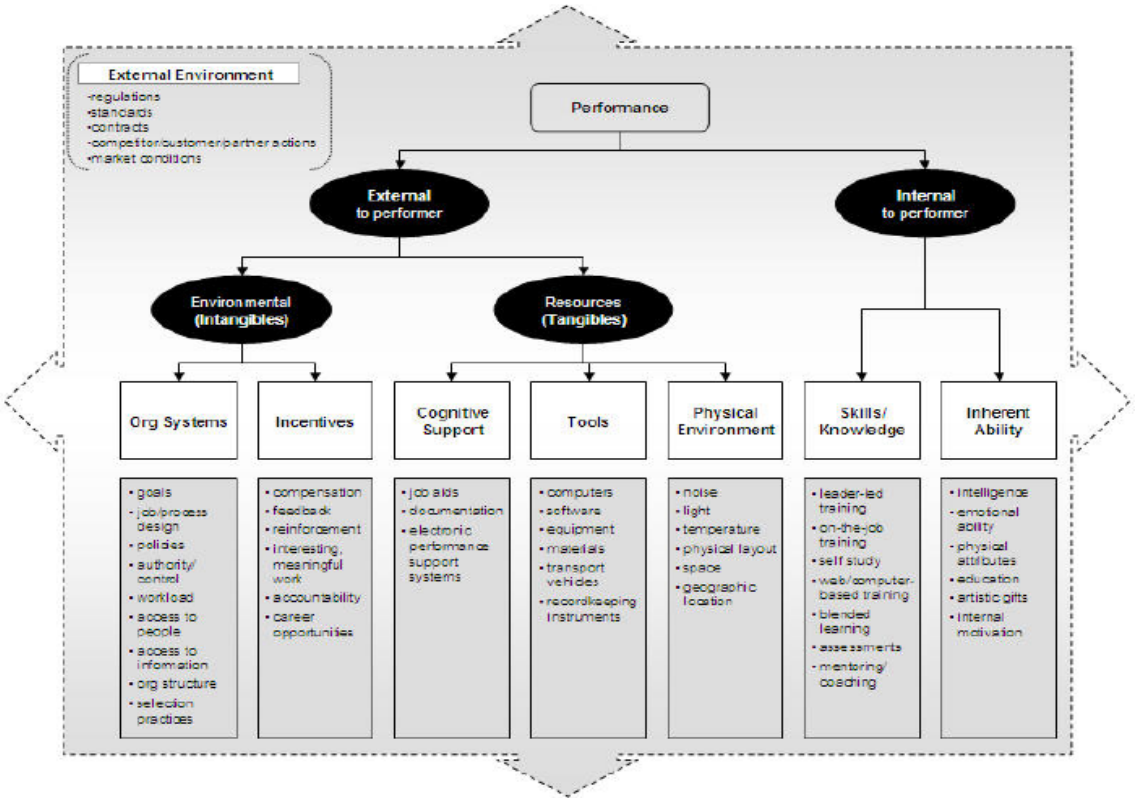


Figure 4: Refined Wile HPT Model

From, Gilmore, E. R. (2009) An evaluation of the efficacy of Wile's taxonomy of human performance factors. (Doctoral dissertation, Indiana University). Retrieved September 16, 2009, from Dissertations & Theses @ CIC Institutions.(Publication No. AAT 3319927).

Scholars such as Gilbert (1978/2007), Harless (1970), Mager and Pipe (1997), Rossett (1992), and Bichelmeyer & Horvitz (2006) have all contributed to the understanding of what influences performance, but it is Wile's work that is the most comprehensive. An eighth factor, external environment, was incorporated into Wile's model by Gilmore in 2009. Wile's (2014) Externality- Tangibility (E-T) Model of Human Performance is an updated version of the original model. The 2014 model "…categorizes nine all-inclusive elements of HPT into families of

elements that can be external or internal to a performer and tangible or intangible" (p. 5). See Figure 7.

These scholars have contributed to the field's knowledge base by incrementally identifying which factors influence performance; however, they do not explain how performance factors work together within a set to enhance performance. Being classified as a diagnostic model, Wile's model does not provide an explanation in terms of selection nor in terms of the relationship among known performance factors. Bichelmeyer and Horvitz (2006) attempt to explain the relationship between performance factors identified by these scholars mathematically by framing the factors in the form of a comprehensive equation.

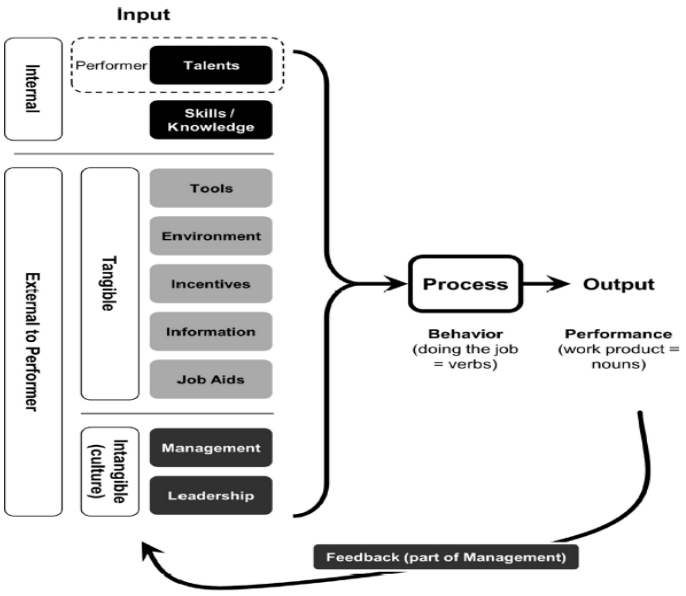


Figure 5: Externality-Tangibility (E-T) Model of Human Performance

From, Wile, D. E. (2014). Why doers do-Part 1: Internal elements of human performance. *Performance Improvement*, 53(2), 14-20.

Bichelmeyer and Horvitz (2006) states:

> …performance (P) is a function of variables internal (I) to a performer such as skills/knowledge {s,k} and inherent ability (ia), as well as variables external to the performer including environment factors (E) such as organization systems (os) and incentives (i), as well as tangible resources (R) such as cognitive supports (cs), tools (t), and the physical environment (pe) within which performance occurs: [P = I({s,k} + ia +E(os + i) + R(cs + t + pe)]. (p. 1167)

The only problem with this approach is that it is difficult to quantify how much of each performance factor is needed to improve performance; nor does it explain the relationships between factors clearly.

In order for the field to grow it is not sufficient to simply say multiple factors influence performance without explaining how, because as currently presented in the literature, performance factors seem to be unconnected to inexperienced eyes (Kang, 2015). Wilmoth, Prigmore, and Bray (2002) note that it is the analyst's responsibility to explain to clients how these seemingly independent performance factors are correlated to one another. However, there is little to no guidance in the literature providing an explanation. It is not only difficult to communicate how multiple factors influence performance but how multiple interventions working together as a set to alter performance.

The performance pyramid

John Wedman's (2010) Performance Pyramid is used as the foundation and structure for Watkins and Leigh's (2010) *Handbook of Improving Performance in the Workplace Volume 2: Selecting and Implementing*

Performance Interventions. Wedman (2010) explains the function of the performance pyramid as:

> …a conceptual framework for analyzing performance problems and a tool for identifying (albeit at a high level) performance improvement interventions. First introduced in 1998, the pyramid has evolved from three contributing factors (vision, resources, and support system) and one outcome factor (significant accomplishments) to a more elaborate framework, a small set of diagnostic tools, and a high-level methodology for implementation (p. 51).

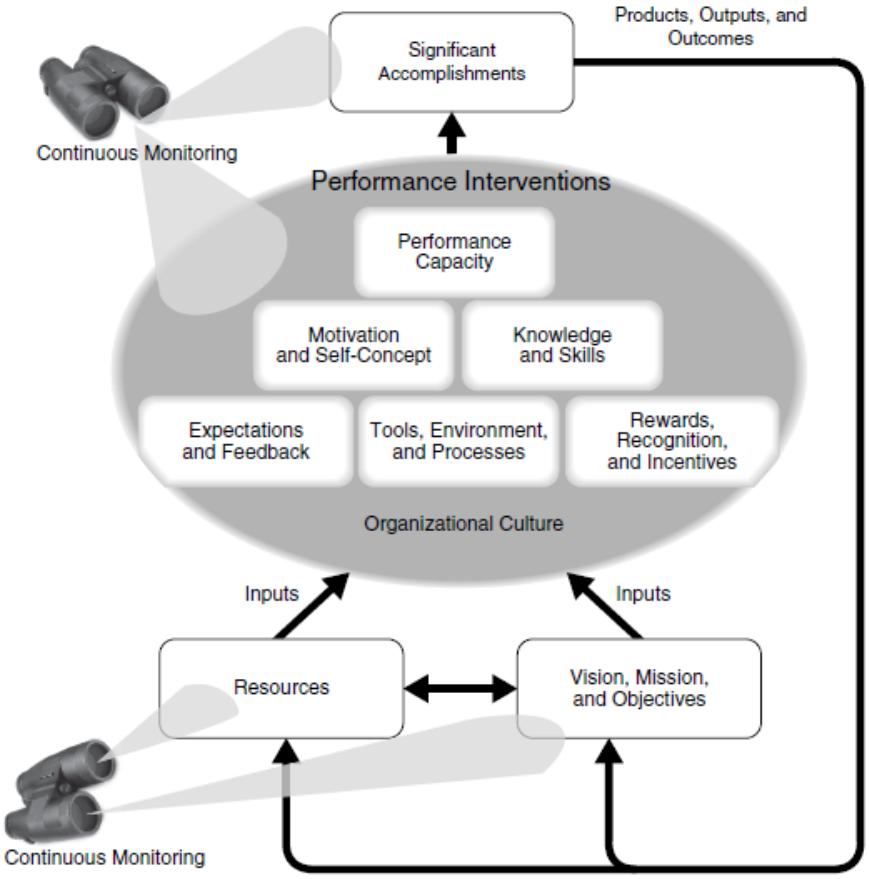


Figure 6: The Performance Pyramid

From, Wedman, J. (2010). The Performance Pyramid. In Watkins, R. and Leigh, D. (Eds). Handbook for Improving Performance in the Workplace - Volume 2: Selecting and Implementing Performance Interventions. San Francisco, CA: Pfieffer.

Although this version of the Performance Pyramid is used as the organizing framework for an entire handbook dedicated to selecting and implementing performance interventions, this pyramid lacks the ability to clearly explain the concept of intervention set selection and does not provide practical guidance on how it is done. Watkins and Leigh (2010), the editors of the handbook, note:

> The Performance Pyramid is no exception; it does not tell you which interventions to use for improving performance. Nor does it define which combinations of interventions work best within the context of your organization. It does provide a map for analyzing where performance systems within your organization may be failing, determining what options are available to you, and ensuring that all elements of your improvement system are contributing to the accomplishment of significant results. (p. 75)

The previous statement by Watkins and Leigh, classifies the Performance Pyramid as a diagnostic model because it focuses on where to search for problems. Holistic models are another type of model that may provide some insight on intervention selection.

Holistic Models

According to Wilmoth, Prigmore, and Bray (2002), holistic models are an integrated approach to visualizing the performance improvement process, and have a "…nonlinear form and unique modeling characteristics. These models are often represented by overlapping domains that exist separately, but form an ideal performance zone when combined" (p. 22). Advancia Consulting (as cited in Wilmoth, Prigmore, & Bray, 2002) provides a graphical depiction of a holistic model (See Figure 7).

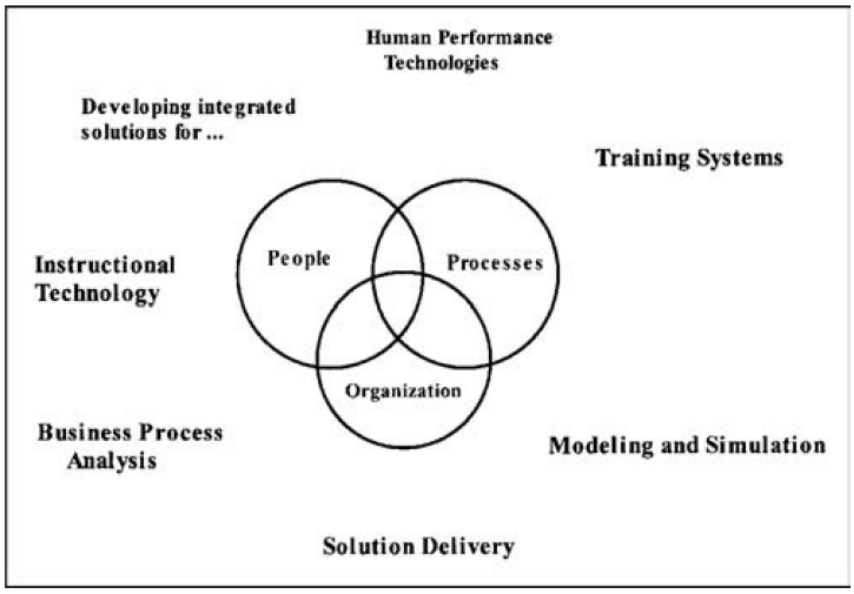


Figure 7: A Holistic Model (Source: Advancia Consulting, 2000)

From, Advancia Consulting (2000). Human performance technologies. As cited Wilmoth, F., Prigmore, C., & Bray, M. (2002). HPT models: An overview of the major models in the field. *Performance Improvement, 41*(8), 16-24.

In Advancia Consulting's model a Venn diagram is used to illustrate the relationship between core activities while the outsider edges identify what influences the activities. This holistic model visually represents how the core "activities work together to develop integrated solutions for the domains of people, processes, and organization" (p. 22).

Ideas Informing Intervention Selection

In order to adequately select interventions one must first know how to arrange each individual intervention in coordination with other interventions, so that various interventions work together to move towards the desired state. There are two main concepts surrounding intervention selection: systemic thinking and diffusion of effect, each of which are discussed below. While each is a critical

components to understanding intervention selection, these concepts are insufficient when discussed separately, thus demonstrating the case for an intervention selection schema.

Systemic Thinking

Scholars in the field assert that HPT is rooted in systems theory, and more specifically, systems thinking (Brethower, 1999; Rosenberg, Coscarelli & Hutchinson, 1999; Girard, Lapides & Roe, 2006). Taking a systemic view means that one focuses on the arrangement of properties within a system and how these properties work together as a whole (Bertalanffy, 1972; Brethower, 1999; Rosenberg, 1999; Girard, Lapides & Roe, 2006). Carleton (as cited in Pershing, 2006) provides a general explanation of what a system is and what is required to make an impact on a system:

> A system therefore is a whole that cannot be divided into interdependent parts. Every part of a system has properties that it loses when separated from the system. Every system has some properties, its essential ones, that none of its parts do. Therefore, when a system is taken apart it loses its essential properties.
>
> To make an impact upon a system requires a systemic approach to deal effectively with all relevant parts of the system in concert. In effect, a solution is not one you "interject" into the system. Rather, it is one that is "aligned" to the overall system within which it has to exist. This applies to all things in the organization, from things as specific as reducing costs to things as complex as altering the culture or improving the leadership. Elements in a system must be dealt with systematically and in a systemic manner. (p. 170)

Although this description of a system and its approach to viewing performance problems is comprehensive, it still does not provide a clear explanation of how to select intervention sets, nor does it explain how to arrange performance factors

within a set, nor does it explain how known HPT performance factors are interrelated to one another within the set.

Scholars in the field view systemic thinking as more of a guiding principle of which one should be mindful when managing and developing various performance factors in a human performance system (Jacob, 1987; Brethower, 1999; Rosenberg, Coscarelli & Hutchinson, 1999; Girard, Lapides & Roe, 2006). According to Watkin and Leigh (2010), "Systemic thinking should be applied throughout the process of an HPT project. In selecting an intervention, it is important to assess the potential impact that decision may have on other aspects of the affected job and organization" (p. 42). However, few scholars provide insight on how to take a systemic approach at the intervention selection stage of the performance improvement process. What does it mean to have a systemic approach at this stage?

Senge (2006) argues that taking a systems view requires focus on long-term results. Tosti (2000) warns that unless change events are tied to "…an overall change goal, linked through communications, and supported by designated individuals and teams," they probably will not have a lasting impact on the system (p.54). He suggests that the process of change needs to incorporate "business driver and feedback" in the system itself, thus resulting in an "ongoing episodic change process" (p. 54). Senge (2006) also stresses the importance of feedback loops and delays by saying, "In the short term, you can often ignore them; they're inconsequential. They only come back to haunt you in the long term" (p. 91). Tosti (2000) asserts that "Change that is truly systemic is

maintained by the organizational system itself; continuing episodic change requires continuing intervention by 'outside' agencies (even though these may be internal consulting units)" (p. 55). Tosti (2000) also notes that when one is planning to change a system, one should view the organization "…from a dynamic systems viewpoint, considering conditions (including input), processes, and outcomes (including feedback)" and also view "…the organizational system at three levels: the organization, the people, and the work" (p. 55). The idea of viewing an organization as a dynamic system with multi-dimensions influences how an intervention set is selected. Watkins and Leigh (2001) argue:

> Without a system perspective of results (one that includes desired/required results at all levels), even a results-focused view of performance improvement can become one-dimensional and benefit only one subsystem (or, indeed, unexpectedly harm other subsystems). A systems approach, while presumably of greater value than an isolated perspective, could have similar negative impacts with individual subsystems (that is departments, teams, organizations) of the system/supersystem (society). Rather, performance improvement professionals should forgo the temptation to focus on improving existing results at just one or two levels…but rather to integrate and link results to be achieved at each of the three levels with a systems perspective. (p.11)

This echoes Rummler's (2007) warning against suboptimization, which is, "Maximizing performance of a component of a system to the detriment of the total system. The total is suboptimized" (p.168). He also suggests that more insight is needed to better understand how to improve human performance in a dynamic system without suboptimization. It is the idea surrounding the integration and linking of performance factors at different levels that needs to be explored when examining intervention selection. Wittkuhn (2006) suggests that, "Further research needs to focus more on those limiting phenomena in systems to gain a

clearer understanding of how the whole and the parts are connected and to better understand interventions and their results" (p. 1284). This point of view coincides with Tosti (2000) who suggests that two key points be kept in mind when planning for change to a dynamic system:

> Dynamic systems have two major characteristics that must be considered in planning any change initiative. First, they tend to reject any change that is not linked to other key components of the system. There may be a temporary blip as people try doing things differently, but the system will soon overwhelm the change as other components begin to counteract it. Second, because dynamic systems respond to changing input and feedback, change must be introduced and implemented in a way that allows it to adapt as demands on the organization continue to change. (p. 54)

Rosenberg (1999) states that, "This approach is also imbued with a heavy emphasis on empirical tryout and testing and involves a fundamental commitment to the recycling of intervention efforts until satisfactory results are obtained" (p.137).

Although systems theory informs the way in which HPT scholars and practitioners think about performance issues it does not adequately explain the interrelationship of performance factors within the context of HPT. Nor does it explain how performance factors work together in an intervention group to influence performance in a dynamic system. Systemic thinking can be used to inform the development of an intervention selection schema, but by itself it is not sufficient for moving towards a better understanding of the selection process because it does not explain the process.

Diffusion of Effect

> Chyung and Berg (2010) state that:
>
> In order to better ensure that selected interventions are implemented as smoothly as possible, they should be designed with a change management strategy in mind. A basic component of change management involves identifying factors that will likely help drive the initiative and factors that might work against the initiative. (p. 43)

Chyung and Berg are correct in their assertion about the use of change management strategy. This conceptual stage requires a closer look at Thomas Gilbert's (1978/2007) idea, which he coined as the *diffusion of effect*. The basic idea behind the diffusion of effect is that each intervention should not have singular maximizing effect or focus, but an effect that permeates throughout an entire set of interventions, generating energy and illuminating power as it is implemented in an organization (Chyunh, 2005). Chyunh (2005), Figure 8, illustrates the diffusion of effect in the following example:

> …in a hypothetical situation, promising a proper level of compensation (incentives) may reduce equity tension in workers and help them feel appreciated and motivated (motives), which in turn may encourage them to pay more attention to the information required for the work (data) and become self-directed to teach themselves to be more competent performers (knowledge)… (p. 25)

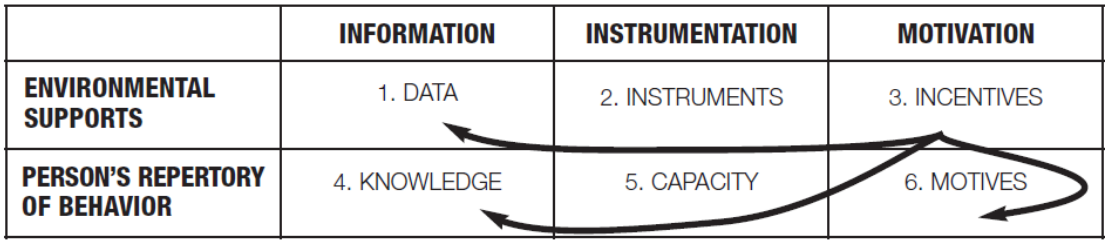


Figure 8: Example of Diffusion of Effect

From "Human performance technology: From Taylor's scientific management to Gilbert's behavior engineering model," by S. Y. Chyung, 2005, *Performance Improvement Journal*, 44(1), 23-28.

Gilbert (1978/2007) goes on to say:

> Here is an empirical fact. Whenever I change some condition of behavior, I may indeed—and often will—have a significant effect on some other aspect of behavior…There is no way to alter one condition of behavior without having at least some effect on another aspect—often, a considerable effect. And usually it is difficult, if not impossible, to determine the degree of the diffusion of the effects. (p. 94)

Chyung and Berg (2010) further explains Gilbert's (1978/2007) idea:

> In other words, it is not advisable to develop a separate solution for every individual cause that is identified for a performance issue. It is the HPT practitioner's responsibility to analyze and select a small number of solutions that would generate the most cost-effective results. (p. 42)

The idea of diffusion of effect is contradictory to the commonly held belief that each cause must have a one-to-one match with a single intervention (Gilbert, 1978/2007). If it is difficult or virtually impossible to calculate the degree of a diffused effect and the concept suggests that one should not match causes to interventions on a one to one ratio. How then is the field of HPT currently approaching performance improvement?

This leads the way for discussing the selection of interventions as a whole set that works together against restraining forces. Watkins and Leigh (2010) note, "It is the HPT practitioner's responsibility to analyze and select a small number of solutions that would generate the most cost-effective results" (p. 42). The question now is, what are those small number of solutions? In other words what are the reoccurring intervention sets used by HPT practitioners that stimulate desired changes in performance? Are there links binding each intervention within these sets? HPT currently has literature supporting the idea of systemic thinking and the diffusion of effect. However, these ideas are not

sufficient to provide a clear understanding of intervention selection. The next step in the discussion is examining performance improvement models used by practitioners to help them work through a performance problem. In order to do this, prominent models in the field are examined to see if they provide insight on intervention selection.

Intervention Selection Principles

Principles are strongly held beliefs and are considered to be fundamental truths by those who hold on to them (Dictionary.com, 2010). Scholars such as Argyris (1970) and Spitzer (1992) have suggested principles to guide intervention selection. These principles are not attached to any particular model, but rather, serve more as overarching guidelines that can be used in any model. Argyris (1970) provides three principles for intervention selection:

1. "valid and useful information" should be used to make decisions (p. 17);
2. "free choice" or "the locus of decision making" should be placed on the client (p.19);
3. "internal commitment" should be established, meaning actions should be internalized by the client in order to establish ownership and responsibility over outcomes (p. 20).

When examining Spitzer's (1992) principle it becomes apparent that the lines between the selection phase and the design phase in terms of intervention sets are blurred, and need to be clarified in the literature. Spitzer (1992) suggests 11 principles for the design and development of effective interventions:

1. “Design should be based on comprehensive understanding of the situation” (p. 116).
2. “Interventions should be carefully targeted” (p. 117).
3. “An intervention should have a sponsor” (p. 118).
4. “Interventions should be designed with a team approach” (p. 118).
5. “Intervention design should be cost-sensitive” (p. 119).
6. “Interventions should be designed on the basis of comprehensive, prioritized requirements” (p. 119).
7. “Intervention options should be investigated” (p. 120).
8. “Interventions should be sufficiently powerful” (p. 120).
9. “Interventions should be sustainable” (p. 121).
10. “Interventions should be designed with development and implementation in mind” (p. 121).
11. “Interventions should be designed with an iterative approach” (p. 122).

Six of the principles provided by Spitzer (1992) should be considered during the intervention selection phase, thus taking place before designing the individual interventions, and therefore must be considered again while in the design phase. For example, Spitzer’s (1992) principle 1 which states that, “Design should be based on comprehensive understanding of the situation” (p. 116), is the most critical ingredient to feed the selection phase of the performance improvement process. The linkage between analysis and selection is well rooted in the HPT literature and it is an established principle that a thorough analysis is necessary in order to move on to the selection phase. Principle 2, 8, and 10 are all closely

aligned with what Gilbert (1978/2007) calls “diffusion of effect,” and should also be considered during the selection phase. When examined together, principles 2, 8, and 10 basically mean that performance consultants should strategically select a small set of interventions with a high overall impact on the problem. Principle 3, which state, “An intervention should have a sponsor” (p. 118), is critical to the selection phase because if any one of the interventions within the set does not have a champion behind it, it will not survive and will reduce the overall effect of the set. Principle 6, which states that, “Interventions should be designed on the basis of comprehensive, prioritized requirements” (p. 119), is similar to principle 3 in the sense that the selection of interventions within a set needs to satisfy individuals within the organization, keeping in mind the needs of stakeholders at various levels. Van Tiem, Moseley, and Dessinger (2004) also suggest that individual interventions should be prioritized and ranked. The idea of prioritizing is critical; however, it overshadows the power of looking at interventions as a set working together as a whole. Scholars such as Mager and Pipe (1997) and Van Tiem, Moseley and Dessinger (2004) all suggest creating a plan of action during the selection phase.

HPT Heuristics

As demonstrated through HPT models, the relationship between performance analysis and intervention selection is clearly visible. However, as illustrated in the literature review, little guidance is provided about how to cross the bridge from analysis to selection. It is critical that practitioners understand the root causes of performance. However, it is also critical that one has an

understanding of what to do once the analysis is completed. Performance improvement literature does provide some clues through the use of heuristics about what to do once the analysis is complete; however, the literature is limited. According to Schraw (2006) “A heuristic is a rule of thumb for solving a problem that often works, but not always. Heuristics are useful ways to solve ill-defined problems, which have no clear solution or a number of solutions” (p. 250).

Sanders and Thiagarajan (2005) present HPT heuristics as root cause categories, or as it is labeled in this dissertation, “performance factors,” accompanied by examples of root causes in bullet points. The relationship between these categories and root causes are considered heuristics in the sense that they are rules of thumbs HPT practitioners use when deciding on what individual intervention to select. Sanders and Thiagarajan (2005) provides the following heuristics:

1. **Root Cause Category**: Improving Knowledge

   If the performer:
   - Does not know how to perform the task
   - Does not understand the essential behaviors that are necessary to be successful at the tasks
   - Has learned the wrong behaviors or skills to do the job
   - Has never had a chance to develop the skills in an appropriate context.
   - Is confusing steps from one task with another (Sanders & Thiagarajan, 2005, p. x)

2. **Root Cause Category**: Improving Motives

If the performer:

- Lacks feedback
- Has completing priorities
- Has conflicting values
- Is rewarded for incorrect behavior
- Is punished for appropriate behavior
- Lacks appreciation for accomplishments
- Lacks adequate compensation, benefits, or monetary rewards
- Has inadequate structure
- Has inadequate information
- Has inadequate commitment
- Has inadequate resources
- Has poor mental or physical health (Sanders & Thiagarajan, 2005, p. x)

3. **Root Cause Category:** Improving Physical Resources

If the performer:

- Receives inferior raw materials to work with
- Receives incorrect materials to work with
- Does not receive correct materials in a timely manner
- Materials are too heavy to handle
- Tools or equipment are not easily accessible
- Tools or equipment are not well suited to the task
- Tools or equipment are difficult to manipulate
- New tools or equipment are difficult and too slow to procure
- Is in competition scarce resources (Sanders & Thiagarajan, 2005, p. xi)

4. **Root Cause Category**: Improving Structure and Process

If the performer:

- Turf battles between managers
- Lack of accountability for outcomes
- Illogical reporting relationships
- Unequal distribution of work
- Redundant work processes
- Incomplete work processes
- Illogical sequencing of work processes
- Misalignment of workers to the tasks that need to get done (Sanders & Thiagarajan, 2005, p. xi)

5. **Root Cause Category**: Improving information

   If the performer:
   - Receives inferior, outdated, or inaccurate information
   - Does not receive information in a timely manner
   - Information is too complex or complicated to be useful
   - Does not receive complete information
   - Information is difficult to access
   - Receives irrelevant information
   - The information is in a physical format that is difficult to manipulate
   - Difficult to procure better information
   - Has lack of standards
   - Has unrealistic standards
   - Has inappropriate standards
   - Has incorrect facts
   - Lacks feedback
   - Has overabundance of information
   - Has unorganized or incorrectly organized information
   - Has trouble converting data from one system to another (either computer system or procedural systems).
   - Has conflicting information (Sanders & Thiagarajan, 2005, p. xii)

6. **Root Cause Category**: Health

   If the performer:
   - Cannot focus on his her work due to clinical depression
   - Continually misses deadlines due to attention deficit disorder (ADD)
   - Argues constantly with co-workers due to sever anxiety related to home-life issues
   - Has missed a lot of workdays due to physical illnesses
   - Has an erratic work schedule because he or she is caring for a sick child, spouse, or parent
   - Comes to work late due to substance abuse problem
   - Cannot lift materials related to the job because of a weak back
   - Forgets to show up at meetings due to Alzheimer's disease
   - Cannot work in his or her new, top-floor office due to acrophobia (fear of heights)
   - Cannot attend large company functions due to agoraphobia (fear of crowds) (Sanders & Thiagarajan, 2005, p. xi)

The following are causes for cognitive support suggested by Rossett & Schafer (2007)

7. **Root Cause Category**: Cognitive Support (i.e. Job Aids)

   If the performer:
   - Cannot be expected to remember something done rarely (p. 21)
   - Work grows more complex and regulated (p. 21)
   - Performance consequences of error is intolerable (p. 22)
   - Performance depends on a large body of information (p. 22)
   - Performance is dependent on knowledge, procedures, or approaches that change frequently (p. 22)
   - Performance can be improved through employee self-assessment and correction with standards in mind (p. 23)
   - Positions have high turnover and the tasks is perceived to be simple (p. 23)
   - Limited time or few resources to devote to training (p.24)

Scholars such as Sanders and Thiagarajan (2005) and Rossett and Schafer (2007) have set the foundation for creating a classification of heuristics based on root causes and performance factors. However, the root cause and performance factors heuristics found in the literature are not exhaustive, though they do provide the groundwork necessary for examining what individual interventions should be selected based on commonly known root causes. More importantly, these foundations are a possible starting point for examining how interventions can be selected as a set. However, there is no current information in the HPT literature explaining how interventions work as a set. Nor are there any studies explaining the patterns of intervention sets in exemplary performance improvement cases. Therefore, in order to establish a better understanding of how intervention selection is to be conducted, an observation of such patterns in exemplary cases needs to be performed.

Summary

There are several gaps in the performance improvement literature as it pertains to intervention selection. As demonstrated in the literature review, there is a lack of knowledge on factors that influence intervention selection specific to systemic thinking and diffusion of effect. The literature also only provides a narrow explanation of the role that models can play in the intervention selection process. The limited number of principles guiding intervention selection that are available to practitioners needs to be expanded. The absence of research focused on the theoretical understanding of intervention selection is a void that continues to exist in the field. These voids also include the lack of literature on how professionals select interventions, specifically with regard to what is involved in the selection process. There is a lack of empirical evidence demonstrating how performance improvement professionals tend to select intervention interventions, as well as a lack of principles designed to guide a practitioner through the intervention selection process. Finally, there is a lack of understanding about the relationship between performance factors within a group of interventions.

As promised, this study adds to the literature base of performance improvement by answering the research questions posed, and illustrating the research process that was involved to answer the questions. Specifically, the study provides the field with an in-depth explanation of how practicing performance improvement professional select interventions. Through the examination of data, patterns emerged that resulted in the formation of intervention set schemata. Memo writing and modeling conducted in this study

generated guiding principles for practitioners to use when consulting clients. The study concludes with the presentation of a substantive theory for intervention set selection.

III. METHODS

This chapter begins with an explanation of grounded theory as defined by its originating authors, Glaser and Strauss (1967). It also identifies how the two authors differ in terms of applying the method and explains the approach utilized in this study. The role of the researcher in this methodological approach is examined, along with a practical explanation of grounded theory.

The chapter continues with an overview of grounded theory's application in this study. This includes an explanation of how the data sources were identified and sampled as well as a description of case selection criteria. Also included are illustrations of the theoretical sampling process which highlights the iterative process of collecting data, code creation, and the analysis of data. Explanations of the open coding procedures, the extensive use of memos, the emergence of a core category, and the creation of models to enable theoretical coding discovery are presented to explain the emergence of the theoretical scheme or substantive theory. The chapter concludes with explanations of the critical elements that emerged to form the scheme.

Grounded Theory Origins

In 1967 Glaser and Strauss penned, *The Discovery of Grounded Theory*, which is considered to be the seminal text on grounded theory. Their work is rooted in the field of sociology. It is here that Glaser and Strauss's idea of theory generation from the constant comparative analysis of data is first articulated. Glaser and Strauss (1967) state:

> Our basic position is that generating grounded theory is a way of arriving at theory suited to its supposed uses. We shall contrast this position with theory generated by logical deduction from *a priori* assumptions…we suggest as the best approach an initial, systematic discovery of the theory from the data of social research. (p. 3)

This text proposed that the role of theory is to 1) predict and explain behavior, 2) advance theory, 3) be applied in practice, and 4) guide research on behavior (Glaser & Strauss, 1967). In 1978, Glaser published *Theoretical Sensitivity* to further explain the emergence of theory from data. Then in 1990, a divergence of opinion about grounded theory's methodological principles became apparent when Strauss and Corbin published *The Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. This text resulted in an intellectual feud between grounded theory's original authors, which centered on how the method should be conceptualized and operationalized (Goulding, 2002; Liamputtong, 2009; Morse 1994).

The introduction of axial coding to the coding process by Strauss is the most visible difference in the Straussian and Glaserian approaches (Liamputtong, 2009). The Straussian approach includes open coding which involves an initial examination of the data, followed by axial coding where the researcher identifies relationships between codes, and then selective coding which involves refining and presenting a model or theory (Corbin & Strauss, 2008; Creswell, 2005; Goulding, 2002). In contrast the Glaserian approach to grounded theory adheres to only open coding and theoretical coding (Goulding, 2002; Liamputtong, 2009). Stern (1994) contends that Strauss and Corbin also provide more of a prescriptive approach to grounded theory. In *Emergence vs. Forcing: Basics of*

Grounded Theory Approach (1992), Glaser criticizes Strauss for making the method too systematic and rigid, which he argues strays from the original intent of grounded theory that advocates for more of an interpretive strategy (Liamputtong, 2009). Glaser's main concern was that Strauss's approach emphasizes axial coding, which is an inflexible technique that hinders emergence and forces data into categories instead of letting them emerge. He argued that grounded theory should afford the researcher the freedom, theoretical sensitivity, and creative space to be led by the theoretical codes and memos that emerge from the process (Glaser, 1992). The two authors also differ in terms of the role of theory that is generated. Glaser argues that "the theory should only explain the phenomenon under study" and not go "beyond the immediate field of study" as advocated by Strauss (Goulding, 2007, p. 45). This study uses a mix of the Straussian and Glaserian approaches to grounded theory which ultimately influences the techniques and terminology used in describing the method's application, as well as the way in which the emergent theory is to be viewed and applied. Ultimately, adhering to grounded theory principles allows for the following research questions to be addressed in this study:

- How do practicing performance improvement professionals select interventions?
- Are there discernable patterns that practicing performance improvement professionals follow when selecting interventions?
- Are there principles that guide intervention selection?
- Are there elements involved in designing interventions that are schematic?

- Is there an underlying theory or model that can be developed that explains intervention selection, including specific relationships between performance factors? If so, what is the theory and does it inform intervention selection?

While grounded theory is an iterative process, Charmaz (2009) provides a basic flow diagram that encompasses the essence of the methodology, starting with the identification of research questions as noted at the bottom of Figure 9.

The Role of the Researcher

Glaser and Strauss (1967) initially suggested that researchers avoid contaminating the analysis of data by avoiding the literature base of the topic under study (Goulding, 2002). However, the authors noted that "no sociologist can possibly erase from his mind all the theory he knows before he begins his research" (Glaser & Strauss, 1967, p. 253). Strauss and Corbin (1990) note that an important element of the grounded theory methodology is the researcher's "personal quality" or theoretical sensitivity, (Strauss & Corbin, 1990, p. 41). Goulding (2002) argues that "most researchers will have their own disciplinary background which will provide a perspective from which to investigate the problem. Nobody starts with a totally blank sheet" (p. 55). Drawing from performance improvement literature on systemic thinking, diffusion of effect, human performance technology heuristics, and intervention selection principles the researcher was able to interpret the data collected by applying theoretical sensitivity.

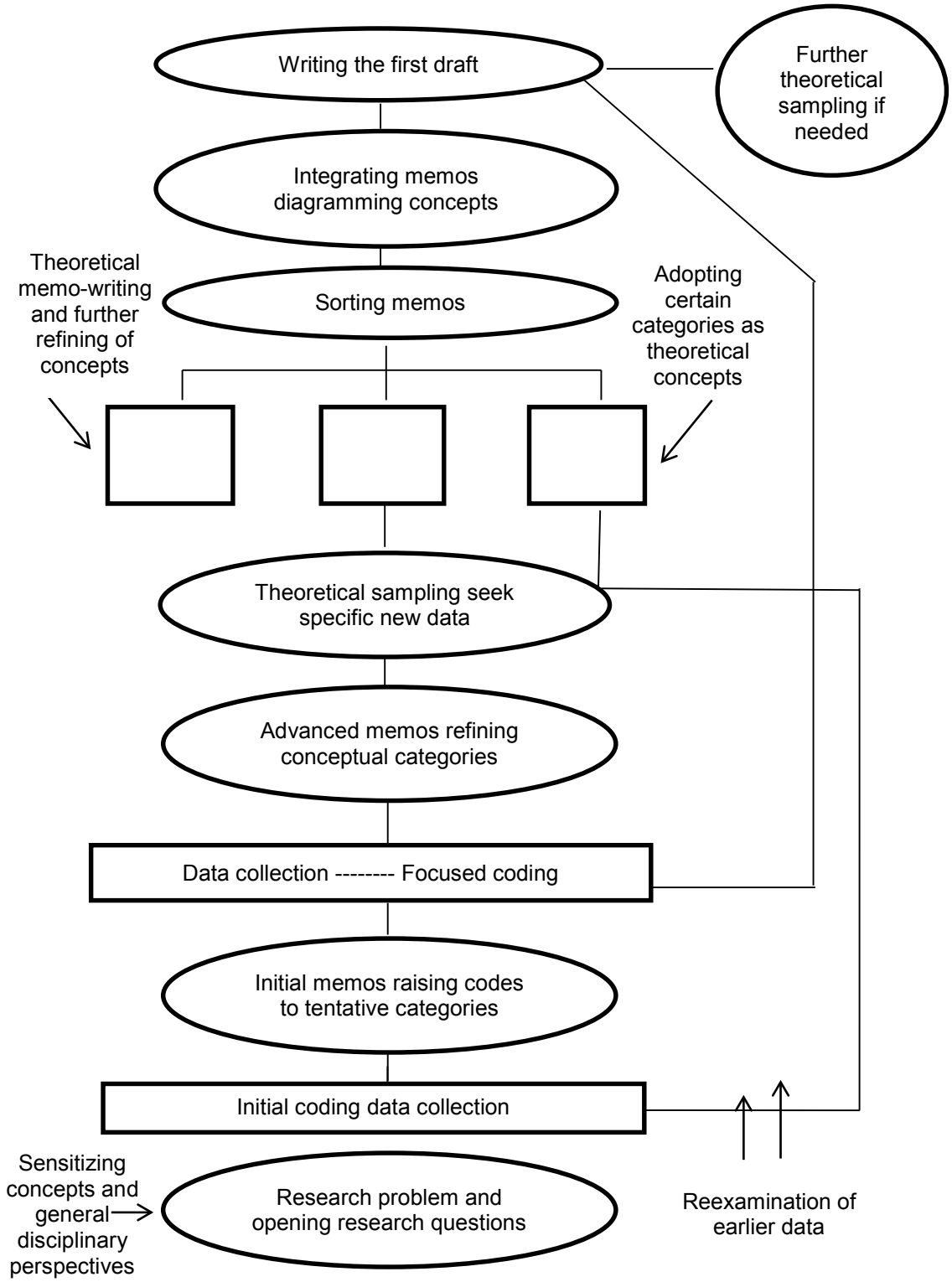


Figure 9: The Grounded Theory Process

Adapted from "Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis," by Kathy Charmaz, 2009, p. 11. Copyright 2009 by SAGE Publications Ltd.

The issue of premature closure or the "under-analysis of textual or narrative data" during the various coding processes is another criticism of grounded theory because it may result in a mere description of data (Goulding, 2002, p. 165). Simply providing a description of data as it relates to intervention selection is not the aim of this research. The intent is for the researcher to extract "…ideas from the data and explains them theoretically in order to provide meaning and explanation of the behaviour" through the development of schema (Goulding, 2002, p. 165). Considering that the goal of grounded theory research is to "develop fresh theoretical interpretations of data" (Goulding, 2002, p. 166), it was essential that the researcher dedicate time and persistence to the iterative analysis process until a new perspective on the data emerged, in order to avoid the problem of premature closure.

A Practical Use of Grounded Theory

> Why generate grounded theory? Why bother, when in each area of life there are people in the know. These people are so knowledgeable that they think they can predict, explain and understand just about everything that happens in their terrain, field, area or world. They are the leaders and consultants; they are their and their colleague's own sociologist. They run the world on their 'know'. (Glaser, 1978)

In the area of performance improvement, there are many experts who can describe the process of how to arrive at performance improvement interventions as a result of their practical experience; however, selecting interventions is difficult (Langdon, Whiteside, & McKenna, 1999). In general, there is a lack of focus in the field on how the intervention selection process occurs. The generation of a theoretical understanding will allow for a knowledgeable

practitioner to “start transcending his finite grasp of things” (Glaser, 1978, p. 13). The fruit of grounded theory enables the practitioner to take ideas to a conceptual level, thus allowing in this case the performance improvement practitioner to apply finite knowledge on interventions to a variety of diverse performance improvement problems.

Grounded Theory in This Study

In order to advance the field of performance improvement, it is critical that researchers study how intervention selection occurs. The purpose of this research is to explore the phenomenon of intervention selection and the process of selection through the documented experiences of performance improvement practitioners. Grounded theory is the appropriate methodological approach for this exploration because it provides a technique for understanding the phenomenon of intervention selection and the process of selection (Corbin & Strauss, 2008*)*. A grounded theory approach also allows for a theoretical schema of intervention selection to inductively emerge from the data found in exemplary case studies that describe the work of performance improvement specialist (Strauss & Corbin, 1990). By exploring the essential characteristics of an intervention selection schema, the field of performance improvement is provided with a powerful representation of the knowledge held by practitioners that has not yet been generally identified. According to Nonaka (1991), the process of “converting tacit knowledge into explicit knowledge” (p. 99), includes first learning or observing the phenomenon, then translating what was observed, followed by standardizing the knowledge acquired. Nonaka (1991) states:

> Indeed, because tacit knowledge includes mental models and beliefs in addition to know-how, moving from the tacit to the explicit is really a process of articulating one's vision of the world - what it is and what it ought to be. (p. 99).

To develop such a schema one must understand 1) the essential elements that make up the concept of intervention selection, 2) how an intervention selection schema can be embedded into other schemata, 3) the schema's ability to embody multi-level abstract concepts, and 4) the schema's ability to capture knowledge in a comprehensive manner and not simply provide a list of concept definitions (Rumelhart & Ortony, 1977).

Content Analysis

While grounded theory is the methodological approach applied to the development of schema, it is the approach of content analysis that allowed the researcher to replicate and validate inferences from texts while considering the context of the application (Krippendorff, 2004, p. 18). In order to collect data on the process of intervention selection, a content analysis of exemplary case studies in the field of performance improvement was conducted. These exemplary case studies represent the work of practitioners and are used as instructional materials to demonstrate core concepts in the performance improvement process. The content analysis of published case studies provides a unique opportunity to unearth emerging patterns in the intervention selection process across cases. It is important to note that grounded theory goes beyond content analysis in that it allows for the development of a theoretical schema, whereas content analysis enables the researcher to analyze patterns in

practitioners' behavior across cases (Hsieh & Shannon, 2006). It is the identification of patterns in practitioners' actions which is fundamental to theory conceptualization (Goulding, 2008). According to Corbin and Strauss (2008), "Along with variation, process can lead to the identification of patterns as one looks for similarities in the way persons define situations and handle them" (p.100). Considering that a goal of this study is to "explain the process, and develop a general abstraction of the interaction and action of people" as it relates to intervention selection, a grounded theory research method is appropriate while using content analysis as the data collection approach (Creswell, 2005, p.411). The development of an intervention selection schema serves as a substantive theory which Glaser and Strauss describe as a "springboard or stepping stone to the development of a grounded formal theory" in the future (Glaser & Strauss, 1968, pg. 79; Locke, 2001).

It is possible that performance improvement practitioners have developed their own unique craft of selecting interventions; however, as illustrated by gaps in the literature, there has not yet been an exploration to find the commonality in their approaches to the selection of an intervention or group of interventions. A schema, or 'schemata' in its plural form, is "a data structure for representing the generic concepts stored in memory" (Rumelhart, 1980, p. 34) and can be presented as a picture, propositions, or a combination of both (Simon and Kaplan, 1998). Rumelhart and Ortony (1977) describe a schema as a concept's "network of interrelationships" that hold together its essential elements (p. 101). This study is based on the idea that practitioners share commonalities in their

approach to intervention selection that have not yet been explored and represented in a comprehensive manner, such as an intervention selection schema. As shown in the literature review, the topic of intervention selection is one that is critical to the field of performance improvement, but lacks the attention it deserves in the literature in the form of theoretical developments. The uncharted nature of intervention selection is another reason why grounded theory is an appropriate research method in this study.

Data Sources

It is only logical that the sampling approach used in this study is one that focuses on data sources that provides in-depth explanation of the performance improvement intervention selection process, such as exemplary case studies. Within the grounded theory literature there are two types of sampling that are noted: purposeful and theoretical sampling, both of which can be confusing if not properly examined. For this study, purposeful sampling refers to how exemplary cases were selected as a data source. Patton (1990) describes purposeful sampling as:

> The logic and power of purposeful sampling lies in selecting *information-rich cases* for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term *purposeful sampling*'. (p. 169)

Purposeful sampling was followed by initial open coding. It is here that the researcher was immersed in the data to identify early codes. Theoretical sampling is a subset of purposeful sampling, and refers to the data coding process that allows for the development of theoretical categories (Locke, 2001, p.

80; Coyne, 1997). These theoretical categories emerge from the researchers' knowledge of the discipline to make grounded contextual sense of the categories. Another potentially confusing characteristic of grounded theory that is related to sampling is the issue of theoretical saturation, which refers to "the saturation of the categories we have developed" during the coding process (Liamputtong, 2009, p. 215). In order to bring clarity to these historically confusing topics within grounded theory, an explanation of their individual significance to the methodological approach is provided, as well as an explanation of how they were applied in this study.

Purposeful Sampling

In this study, purposeful sampling took place before data collection and analysis began. A purposeful sampling approach was used in order to select "information-rich cases whose study will illuminate the questions under study" (Patton, 2002, p. 230). Taking a purposeful sample approach early in the study took advantage of the richness within the study's data source.

Exemplary Cases

Exemplary case studies provide a unique opportunity to examine the performance improvement process in an exhaustive manner. No other data source provides an in-depth repository of performance problems with a variety of performance contexts as do performance case studies. Scholars in the field of performance improvement advocate the collective interpretation of exemplary

case studies to further develop the field's knowledge base (Sugrue, 2004; Sugrue & Stolovitch, 2000; Foshay, Moller, Schwen, Kalman & Haney, 1999). Examining exemplary published case studies that were generated in the field of performance improvement is the most suitable data source for this study because it allows for the examination of the process of intervention selection. Twenty-three exemplary case studies were selected for this study and provided an opportunity to illustrate the process of intervention selection, for which the specifics have been elusive in the field. These data sources also provided a unique opportunity to introduce the idea of treating interventions as groups as opposed to single or mutually exclusive interventions that address a performance problem.

Focusing the attention of the dissertation on exemplary practice in the field aligns to a core principle of performance improvement, which is to examine exemplary performers in order to identify key aspects of their performance. Exemplary refers to how the cases were written, how the practice is conducted, and that the cases were reviewed and edited for the casebook. However, does not necessarily mean exemplary results. The analysis of exemplary cases leads to a theoretical intervention selection schema that ultimately will help to inform practitioners who have not mastered the process. The majority of the cases are published through leading organizations within the performance improvement community such as the International Society for Performance Improvement (ISPI) and the Association for Talent Development (ATD), (formerly American Society for Training & Development - ASTD). Several of the selected ATD cases were

edited by Dr. Jack Phillips, an expert in accountability, measurement, and evaluation in the field of performance improvement. All of the cases were written to instruct the reader on how to apply performance improvement best practices. In the preface of the case books edited by Dr. Phillips, he provides the following rationale for the cases being included as teaching tools for practitioners, instructors and professors, and managers. These include the cases ability to:

1. Provide the thought process, techniques, methodologies, and strategies of real world practitioner.
2. Illustrate real-world problems.
3. Generate discussion on the performance improvement process.
4. Focus on the challenges and difficult situations practitioner confront and to recognize the work of professionals by presenting best practices.
5. Serve as self-teaching tools (Phillips & Phillips, 2002).

Some of the cases have received the Excellence in Practice Award from ASTD which undergoes a blind review process by experts in the field. Other cases were selected from the ISPI *Performance Improvement Quarterly*, a peer reviewed journal in the field of human performance technology (HPT) which was created to inspire discussions in the field. While others come from ISPI's practitioner based journal, *Performance Improvement,* which is geared towards practitioners' learning from one another through articles and explanation of best practices. Several of the cases came from *Getting Results: Case Studies in Performance Improvement* edited by Esque and Patterson (1998) where the editor chose cases that stated a business problem, identified a specific

intervention, measured results in terms of performance outcomes, and offered lessons learned. Another source for the cases came from *Best Practices in Organizational Development and Change* by Carter, Giber, and Goldsmith (2001) where the authors chose the cases based on their having the following elements: 1) an analysis of need 2) a building block of a case 3) identified an audience 4) a design of an intervention 5) an implementation of interventions and 6) an evaluation of project.

Case Selection Criteria

The criteria for selecting the cases in this study follows the key features of sampling based on work done by Patton (1990), Miles and Huberman (1994), Glaser and Strauss (1973), and Strauss and Corbin (1990), which are summarized in Curtis, Gessler, Smith, and Washburn (2000). Table 2, *Criteria for Selection*, highlights the criteria for selection. First, the case had to define a performance problem. This criterion was critical to the authenticity of the intervention selection problem. Having a clearly defined performance problem allowed the researcher to examine the intervention selection process in the context of a problem. Second, the case had to address the research questions posed, all of which revolve around the selection of an intervention. Therefore, all of the cases had to identify selected interventions. Third, a case also had to provide the researcher with a rich source of data to analyze. Since the concept of intervention selection is not articulated in the performance improvement literature, having a rich source of data within the cases that were used in the

intervention selection process allowed the researcher to identify the information needed to develop an intervention selection schema, produce a credible theory, and identify ideas for further research. Fourth, the case had to include the selection of interventions to enable generalization across cases.

Table 2:
Criteria for Selection

Criterion	Reason
Define a performance problem	This criterion was critical to the authenticity of the intervention selection problem. Having a clearly defined performance problem allowed the researcher to examine the intervention selection process within the context of the problem.
Identify a intervention	The case had to address the research questions posed, all of which revolve around the selection of an intervention. Therefore, all of the cases had to identify an intervention.
Rich source of data	A case also had to provide the researcher with a rich source of data to analyze. Since the concept of intervention selection is not articulated in the performance improvement literature, having a rich source of data for the cases allowed the researcher to identify the information needed to develop an intervention selection schema, produce a credible theory, and identify ideas for further research.
The selection of an intervention	The case had to include the selection of interventions to enable generalization across cases. Each case had to provide the researcher the opportunity to categorize individual interventions within performance factor categories.
Articulate the rationale for the intervention selected	The case had to clearly articulate the rationale for intervention selection. The bare minimum for this criterion was an explanation of the analysis conducted before the selection took place.

(table continues)

Table 2. (continued)

Criterion	Reason
Provide the opportunity to make analytic generalizations	The case had to provide the opportunity to make analytic generalizations of intervention selection. If not, the resulting developed schema would not be useful for practitioners facing various performance problems.
Published source within the field of Performance improvement	Each case came from a published source within the field of performance improvement and documents a real-world intervention.

Each case had to provide the researcher the opportunity to categorize individual interventions within performance factor categories. Fifth, the case had to clearly articulate the rationale for intervention selection. The bare minimum for this criterion was an explanation of the analysis conducted before the selection took place. Sixth, the case had to provide the opportunity to make analytic generalizations of intervention selection. If not, the resulting developed schema would not be useful for practitioners facing various performance problems. Seventh, each case came from a published source within the field of performance improvement and documents a real-world intervention.

Data Collection & Sampling

> Theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges. (Glaser, 1967, p.45)

The iterative process of theoretical sampling was the engine that fueled the emergence of intervention selection as the core category in this study. It

began with the collection of data through the open coding process and generated momentum throughout the study with constant comparative analysis and the use of memos. This momentum built over time as the researcher coded the cases multiple times. During the open coding process the researcher was guided by rules suggested by Glaser (1978). The first rule involves the researcher constantly asking three questions, *"What is the data the study of?", "What category does this incident indicate?" and "What is actually happening in the data?*" (p. 57). These three questions provided the researcher with focus when the data became overwhelming, direction when the original intent of the study became subsumed, and helped in the search for the underlying process in the data that explains the core issue that is, how do consultants go about selecting interventions.

The second rule suggested by Glaser (1978) is to "*analyze the data line by line*, constantly coding each sentence" (p. 57). The unstructured process of open coding began with highlighting keywords, phrases, and sentences on hard copies of the cases and focused on descriptive incidents identified by the researcher that focused on the process of performance improvement. This resulted in over a hundred codes being generated. During the open coding process the researcher took time to adhere to the fundamental tenet of grounded theory which is to "stop and memo" (Glaser, 1978, p. 83). The generated codes were the result of multiple coding sessions and constantly comparing incidents in each case as the codes emerged. The codes were aggregated into groups or tentative categories at a higher level in order to describe what was happening

throughout all of the cases. See Appendix D for decision rules used to generate the categories for the substantive theory of intervention set selection.

The study was not focused simply on providing frequency counts of intervention types for inventory purposes. It focused on both the manifested and latent evidence of multiple interventions working together within the context of performance improvement cases. It required the researcher to take a “summative approach to qualitative content analysis [which] starts with identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content” (Hsieh & Shannon, 2005, p. 1283). Grouping the codes together enabled the researcher to better understand the contextual meanings of the content. See Appendix E for an outline of the theoretical categories and codes that were generated and led to the substantive theory of intervention set selection.

The rule of self-coding lead to the fourth rule which calls for constant memo writing. This was done extensively because the researcher was not confined to pre-set codes and was able to capture insights about the data as they emerged. Coding the data into memos required the researcher to find a quiet location to think and write, which occurred on a weekly basis for months. It was during the constant comparative process that memos and diagrams were developed that led to a theoretical understanding of the core of variable interventions and the processes of their selection. The memos began as yellow sticky notes representing general thoughts about the cases during the first reading of each case. Although this first memo process was an unsophisticated

approach to memoing, it did provide the researcher with a way to get started in analyzing the cases. More importantly, it enabled the researcher to develop ideas without the confines of structured writing which is what Glaser (1978) refers to as the “freedom of memoing” where the researcher has no worries of writing and presenting correctly (p. 85). Before the first round of case reading was completed the sticky note approach to memo writing became unmanageable and led to jotting down memos into a black and white composition book. The composition notebook was periodically used throughout the study in order to quickly get ideas on paper, but it was eventually surpassed by the use of the Nvivo software system. NVivo 10 qualitative data analysis software made the research process more efficient. The software allowed for:

1. easy storage of source documents,
2. creation and classification of codes,
3. visualization of ideas through model building,
4. production of memos, and
5. examination of each individual case and across-case analysis.

The service of a typist was obtained in order to format the cases into Microsoft Word so that the documents could be uploaded into the NVivo software and stored as source documents within the software. Once stored, the source documents were used for collecting data. The functionality of the software enabled the researcher to adhere to the grounded theory method of coding more easily than using a paper based approach. The researcher was able to use the query function to search for key words, phrases, sentences, and paragraphs in

each case so they could be labeled. NVivo also allowed the researcher to manage the many codes identified, and assisted the researcher in the development of data and information categories. Nvivo also served as a tool for the development and visual representation of ideas explored throughout the grounded theory process, thus enabling the researcher to analyze the individual case and across case content more efficiently. The software served not only as coding modeling tool, but functioned as a “memo fund” which was “highly sortable”, thus ultimately satisfying the goals of memoing as suggested by Glaser (1978, p. 83-92). The ability to consistently retrieve and edit memos supported the researcher in the development in schemata and principles throughout the study. See Appendix F for samples of excerpts from the memos generated throughout the study.

Codes were eventually reduced into concepts. Concepts were generated by comparing indicators of the concepts. The concept generation process involved “…confronting similarities, differences and degrees of consistency of meaning between indicators…” which ultimately allowed the researcher to be more selective and generate core categories (Glaser, 1978, p. 62). This required the researcher to constantly compare each case. In order to do this, Glaser’s third rule which states that “the analyst must do his own coding” was adhered to so that the researcher could make connections and insights that emerged in the data through memos (p. 58). This was time consuming, but allowed the researcher to be immersed in the data and see the data from different angles as well as to be sensitive to what was in the data as it related to multiple

interventions being selected over a variety of cases. The following are concepts related to consultant selection behavior:

- Awareness of performance problem
- Identification of problem(s) positions within the organization
- Soundness of analysis conducted
- Consciousness of factor influencing human performance in organizations
- Knowledge of individual intervention behaviors

Individually these concepts do not explain how the selection process takes place in its entirety (Goulding, p. 121, 2002). However, it is a starting point for understanding components of the selection process.

Each concept has properties and dimensional ranges that emerged after being refined through memos and constant comparison. Tables 3 through 7 presents the conceptual codes. Each conceptual code has properties that give it explanatory power as well as dimensional range identifying the "presence or absence" of the concept in the data. For example, in Table 3, *Awareness of Performance Problem* is presented as a conceptual code with properties that include consequences, acknowledgement, and willingness to address. Each property is dimensionalized as indicated by, first order → third order, to show the range in which the concept exists in the data or cases. Dimensions are not used as quantitative values of the concept. They focus attention on understanding the meaning of a concept by showing the varying degrees in which it can exist (Goulding, 2002).

Table 3:
Awareness of Performance Problem

First Order – Problem Awareness		Third Order – Problem Awareness
Low consequences	→	High consequences
Low acknowledgement of problem	→	High acknowledgement of problem
Unwillingness to address problem	→	High willingness to address problem

In Table 3, *Awareness of Performance Problem* tends to relate to the intensity of the consequences of the problem, that is, whether there are high or low consequences. *Awareness of Performance Problem* also tends to relate to whether or not the organization acknowledges that there is a performance problem. High acknowledgement means that the issue is accepted as a problem and low acknowledgment meaning the organization does not view issues as part of the overall performance problem. *Awareness of Performance Problem* as a concept also means that there is either a willingness or unwillingness in the organization to address the performance problem and the range in which this willingness exists varies. In Table 4, *Problem Position* is presented as a conceptual code with properties that include the extent to which the problem is embedded in the organization, meaning is it localized or deeply rooted in the organization. *Problem Position* also refers to the level in which the problem is situated, whether it is at the worker level or further up towards the organizational system level. The *Problem Position* can either be visible in a single location or many locations. The *Problem Position* can also spread to other parts of the organization, which is expressed as a dimension in the form of stationary to dynamic.

Table 4:
Problem Position

First Order – Problem Position		Third Order – Problem Position
Narrowly embedded	→	Broadly embedded
Low levels (Worker)	→	High levels (Organizational)
Single location	→	Multiple locations
Stationary	→	Dynamic

In Table 5, *Soundness of Analysis* is presented as a conceptual code with properties that include the extent in which the consultant is confident in the problem's root cause. The degree to which the data source is reliable is also indicative of the *Soundness of Analysis*. The *Soundness of Analysis* also ranges from limited data collection to robust.

In Table 6, *Factor Influencing Performance* is presented as a conceptual code with properties that include the extent in which the performance is related to a person that is, performer. An indicator of a *Factor Influencing Performance* is whether or not there are one or more than one performance issues that are the focus of attention or pain. The extent of influence the factor has on performance provides insight on how far the influence stretches across performance in the organization.

Table 5:
Soundness of Analysis

First Order - Soundness of Analysis		Third Order - Soundness of Analysis
Confident of problem's root cause	→	Unsure of problem's root cause
Assumptions as information source	→	Data as source of information
Limited data collection	→	Robust data collection

Table 6:
Factor Influencing Performance

First Order - Factor influencing performance		Third Order - Factor influencing performance
Internal to the performer	→	External to the performer
Singular performance focus	→	Multiple performance foci
Shallow performance factor scope	→	Extensive performance factor scope

In Table 7, *Behaviors of Individual Interventions* is presented as a conceptual code. Its properties include organizational support, which can be described as the extent to which a given intervention will be supported by vested interests in the organization. The direction of the force in which an intervention gains momentum provides insight as to how it will be accepted and maintained by various entities in the organization. The degree to which an intervention is feasible to implement provides understanding on how well it will fit into a given organization. Understanding the strength or intensity of the individual intervention explains how influential the intervention is in creating change in a particular performance problem. Similarly the range or location is indicative of how influential the intervention can be in impacting performance problems.

Table 7:
Behavior of Individual Interventions

First Order - Behavior of individual interventions		Third Order - Behavior of individual interventions
Minimal organizational support	→	Maximum organizational support
Bottom-up driving force	→	Top-down driving force
High feasible of implementation	→	Low feasible of implementation
Weak intensity	→	Strong intensity
Limited localization	→	Extensive localization

Core Variable Formation: Intervention Selection Process

The researcher noted that most often interventions did not work individually or in silos, but worked together to support each other in reducing or eliminating a performance gap. In addition, there were concepts that evolved early in the selection process before interventions were identified. As a result a core variable began to emerge and was used to selectively code the data going forward (Glaser, 1978, p. 46). The researcher felt that further coding was necessary. According to Corbin and Strauss (2008), it is essential to analyze a process when one is seeking to develop a theory or schema. The central phenomenon in this study is *interventions* and the process under examination is the *selection* of multiple interventions connected to each other to close a performance gap. As Corbin and Strauss note, a "phenomenon stands for the topic, the event, the happening, the goal, or the major idea (category or theme) contained in a set of data" (p. 101). In the case of this study interventions and defines the process as the "…means of getting there…" or the selection of an intervention (p. 101). Strauss and Corbin (1990) explain process as "the linking of sequences of action/interaction as they pertain to the management of, control over, or response to, a phenomenon" (p. 143). According to Creswell (2005), the goal is to isolate and identify the actions within the process in order to place them in categories. He notes, "Categories in grounded theory designs are themes of basic information identified in the data by the researcher and used to understand a process" (p. 404). By examining the process of intervention selection the researcher is specifically looking for patterns involved in the activity of selecting

multiple interventions, actions taken by the selector, and interactions with other elements in the process. The intent is to identify the components of the selection process that transcend all performance improvement cases, thus providing the field with a more abstract understanding of intervention selection. A broader understanding of intervention selection would include 1) the identification of filters leading to intervention selection, 2) the measurement of multiple intervention comprehensiveness, 3) the development of rules and principles that guide selection and 4) the magnitude of context and process evolution over time.

Theoretical Coding

It became very difficult to see what was happening in the data by analyzing the cases in their original text form. As a result, modeling was used as a way to evolve memos and enable theoretical coding. The researcher began drawing simple models of connections between concepts in order to explain what was happening in the data. Glaser (1978) noted that modeling is an alternative way to theoretically code and "…any theory can be linearly drawn in the fashion of a molecule" (p. 81). Modeling the process in the cases lead to coding at a more conceptual level which allowed the researcher to identify how the codes and concepts related to one another.

> Though never fully known (they are always emerging), the fullest range of theoretical coding possibilities give the grounded theorist a powerful approach to generation of theory. It sensitizes him to the myriad of implicit integrative possibilities in the data. (Glaser, 1978, p. 73)

These models allowed the researcher to see the data in a new light in order to assist in the answering of the research questions. The first rounds of

modeling the cases lead the researcher back to further data collection and coding. By content analyzing the data for the selection process, the researcher was able to represent the “sequences of action/interaction/emotions changing in response to sets of circumstances, events, or situations” (Corbin & Strauss, 2008, p. 98). *Figure 10: Case 3 in Model Form* is an example of a case coded in model form. The model provided an avenue for the researcher to explain the explicit and implicit relationships in the data as they related to the interventions selected (Glaser, 1978, p. 56).

In Case 3, the performance problem revolved around machine changeover time causing a bottleneck in organization operations. The organization acknowledged the problem and was willing to address it because the consequence of not acting on the bottleneck would make the company less competitive in the market. The bottleneck issue was a dynamic problem that was embedded throughout the organization and impacted the worker, work process, and organizational goals. The root cause of the problem was found from robust data which included reviewing production reports and videotaping the process for observations, therefore generating confidence in the accuracy of the root cause.

There were multiple performance factors which extended beyond the control of the performers. The performance factors were extensive and included organizational factors such as goals, standards, strategic direction, and job redesign; incentives including feedback; and tools including quick disconnect hoses, air-driven drill, and bulletin boards.

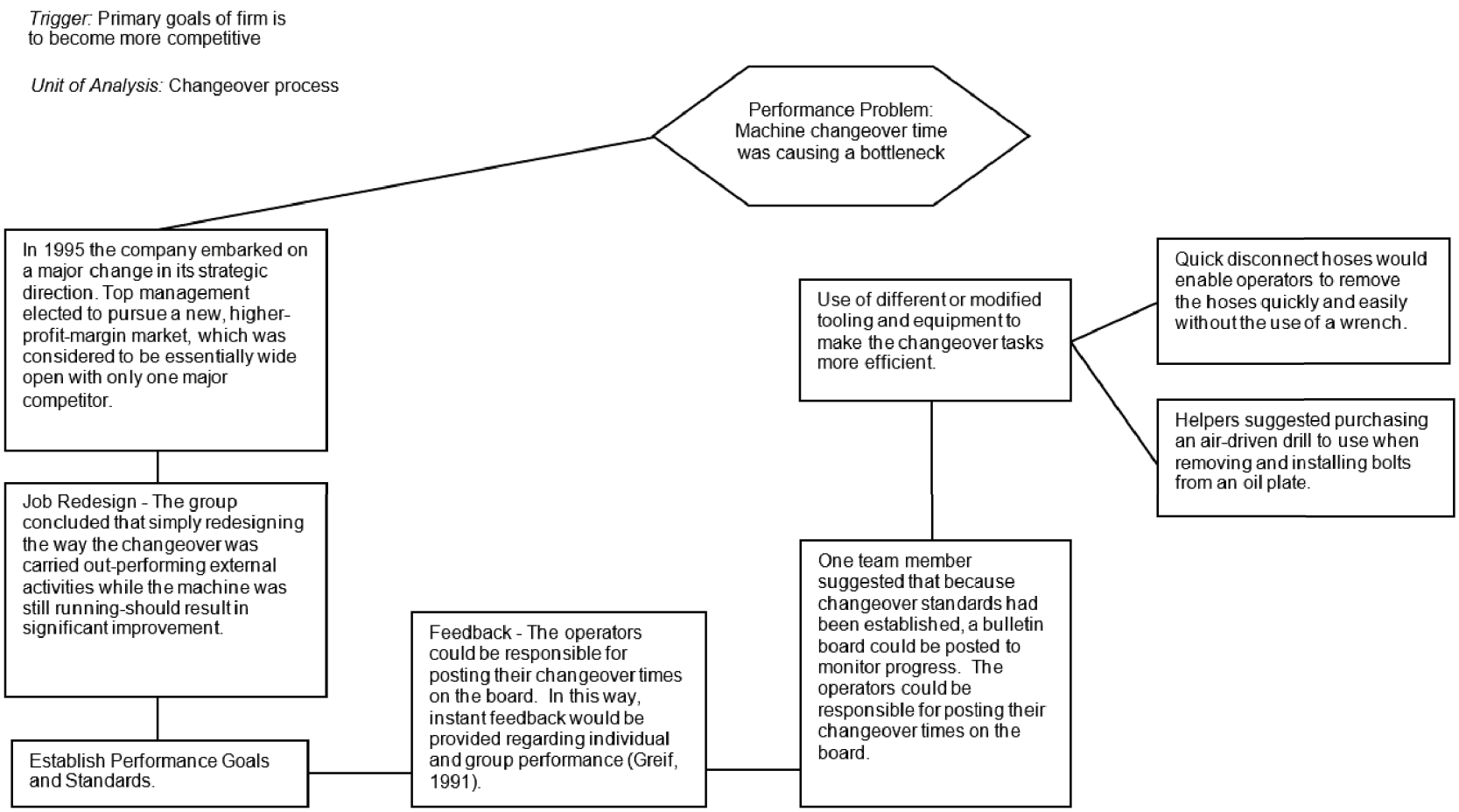


Figure 10: Case 3 in Model Form

From "Improving Roll Changeover Performance in a Manufacturing Organization: Peabody Processing Incorporated," by Stephen B. King. In J.J. Phillips, W. J. Rothwell, & D. D. Dubois (Eds.), *Improving performance in organizations* (pp. 111-126). Alexandria, VA: ASTD.

The higher order interventions including goals, standards, strategic direction, and job redesign had maximum support from the leadership in the organization. However, there was a mix of top-down driving forces and bottom-up driving forces for each intervention. The feasibility of each intervention working was high as long as the individual interventions worked in coordination with each other and within the organization's structure.

Modeling the cases resulted in another concept being identified along with its property dimensional range. The concept of an intervention set was combined with the central phenomenon to make a core category. Over time concepts were subsumed into higher order categories. The point of saturation occurred during the across case analysis which informed the researcher that it was time to stop collecting data. The researcher did not find any "new theoretical insights" or properties related to the core category (Charmaz, 2009, p. 113). Glaser (1978) states that a core category should be: central to understanding the pattern of behavior; occur "frequently in the data;" a time consuming saturation process; meaningful and easily connected to other categories; provide provision for the creation of formal theory; fruitful and have carry through; "completely variable" under various conditions; "…explains itself and its own variation;" sound enough to prevent others source from creating a core; have high explanatory power in that it encompasses all relations; "any kind of theoretical code" (p. 95-96).

In summary, the flow diagram of grounded theory presented earlier in this chapter was carried through the entire study. It is important to note that even though the process is presented as a linear process, it was implemented as an

iterative process that took several rounds of analysis in order to yield results. The results of the repetitive process and the across case analysis are presented in the following chapters.

IV. RESEARCH FINDINGS

This chapter is organized by the findings associated with the research questions. Key milestones in the process of the grounded theory method are presented as research questions are answered.

The chapter begins by addressing the research question, *Are there discernable patterns that practicing performance improvement professionals follow when selecting interventions?* The answers to this question are presented as initiating principles generated from the initial reading of the cases. This involved initial coding, the conceptualization of data categories, and the writing of memos.

The chapter goes on to demonstrate, *How do practicing performance improvement professionals select interventions?* These findings are centered on the case analyses that evolved throughout the study. As is the nature of the grounded method, the analyses at this point became more robust and more focused on the intervention selection process. The use of memos, seeking of more specific data, and the refining of concepts yielded the concept of an intervention *set* and the formulation of a definition for intervention set selection. The findings also focus on the research questions, *Are there elements involved in designing interventions that are schematic? Are there principles that guide intervention selection?* To answer these questions, six schematic elements are presented along with required and permeating principles.

The final section presents findings from the multiple iterations of the coding and across case analysis. Annotations in conjunction with the literature

review were used to solidify identified principles and patterns. The chapter concludes with explanations of the critical elements that emerged from the cross case analysis. It also presents memo integration and the diagramming of concepts that were used to produce an intervention set selection substantive theory. The chapter concludes with a presentation of the intervention set selection substantive theory as an answer to the following research question, *Is there an underlying theory or model that can be developed that explains intervention selection, more specifically the relationship between performance factors? If so, what is the theory and how does it inform intervention selection?* The findings, substantive theory, schemata, and principles spark thoughts for further discussion and identify where and how the findings fit into the field's literature. As suggested by Charmaz (2006), references to the performance improvement literature allows for clarification, comparisons, and future research recommendations. These insights are presented in chapter 5, the conclusion, implications, and reflections chapter.

Finding 1: There Are Patterns

Open coding revealed many initial patterns that performance improvement professionals tend to follow. As noted in the methods chapters, the unstructured process of open-coding resulted in hundreds of codes. These codes were based on information in the cases the researcher deemed as related to the intervention selection process. The researcher used knowledge and experience in the field of performance improvement to identify initial codes in the open coding process. Clusters of codes evolved after the first time the cases were coded. By the

second time the researcher coded all the cases, categories started to crystalize as a result of continuous coding (see Table 8).

Raising, that is repeatedly combining and integrating all of the identified codes into initial categories, revealed tentative categories or patterns of behavior exhibited in the cases by the client and practitioner as displayed in Table 8.

A noteworthy finding was the pattern in behavior by the clients in the intervention selection process. Understanding the *home remedy* behavior a client takes before a professional performance improvement specialist becomes involved helps the professional diagnosis the performance problem and additional problems that the home remedy may have caused. The four key patterns identified include:

1. Seeking a method for solving a problem without understanding problems
2. Degree of change or lack of collaboration
3. Greater attention makes the client more aware of problem areas without specificity
4. Formulation of preconceived solutions to address problem areas

The point at which the behavior patterns of a client and a professional tend to merge is when an organizational trigger or symptom becomes too complex for a home remedy solution.

Table 8:
Tentative Categories

Codes	Grouping/Tentative Categories
-Client uncertain of how to solve problem -Analysis dispelling assumptions	-Seeking methods to solve a problem
-Cross function effort -Culture -Support for change -Client and consultant partnership	-Sense of openness to change and collaboration
-Problem with employee performance -Problem with process	-Awareness of a problem in a general area within an organization
-Leadership beliefs about problem -Leadership reasoning for training	-Formation of preconceived ideas about how to take action to solve a problem by individuals with power and position
-Internal signs indicating change -External triggers indicating change	-Change in an organization is induced by a trigger or symptom
-Findings -Needs analysis questions -Sampling -Analysis methodology -Data driven analysis -Data source -Objective data analysis	-Use of research methodology elements to understand root causes of problem
-Industry standards -Evaluation	-Measuring performance internally and externally
-Barriers involved in analysis -Barriers involved in development -Issues with Implementations	-Barriers are present at various stages in the problem solving process
-Skills -Knowledge	-Various types of skill and knowledge factors can be a part of an overall problem
-Recognition/Rewards -Critique of instructor -Measurement of performance -Measures -Evaluation -Feedback -Performance goals and objectives -Reporting -Performance standards -Penalties -Encouragement -Compensation	-Various types of incentive factors can be a part of an overall problem
-New process -New Procedure -Redesign of procedure -System -New leadership -Program change -Mission -Standards -Information -Values -Strategic goals	-Various types of organizational system factors can be a part of an overall problem

The first finding concentrates on triggers, symptoms, and attention grabbers. Each case had a trigger, symptom, or attention grabber that was causing or could eventually cause a disruption in the organization's desired performance. Whether internal or external to the organization, the trigger or symptom forced the stakeholders to pay attention to the performance because it could threaten the organization's survival or be an opportunity for growth and expansion. Table 9 provides some examples of case annotations of triggers, symptoms, or attention grabbers that forced an organization to take action and seek performance consulting. For example, in case 12 it was evident that public pressure began to build up to a point where it could not be ignored and efforts to address government inefficiency had to be made. This pressure was the trigger or attention grabber that enabled the implementation of the case intervention set.

It became evident that before the intervention selection process takes place and early in the process the practitioner engages in a client learning process or relationship building that is a part of the overall analysis process. This relationship is also essential to the intervention selection process and ensures that the lines of communication remain open throughout the project. The concept of learning about the client is documented in the performance improvement literature (Rush, 2012). However, what is missing in the literature is how to leverage this information for value added consultation, including client home remedy behavior, triggers, symptoms, and attention grabbers.

Table 9:
Triggers and Symptoms Annotations

Case #	Case Title	Annotation: Trigger or Attention Mechanism	Page #
12	Strategic Performance Measurement The Case of Mississauga Transit	In this era of heightened fiscal responsibility and increased scrutiny of public organizations, local government is being put under increased pressure to improve the efficiency of its operations while becoming more responsible to the needs of its constituency.	p. 20
13	Taking Measures Beyond Monitoring To Driving Performance	Texaco Refining and Marketing Inc. (TRMI) management wanted to involve all levels of employees in organizational goals more effectively. They knew that if their operational measures were in the top performance quartile of industry standards, they would be operating effectively and competitively.	p. 119
14	Organization Effectiveness and Training Partnering to Improve Business Results	"Better, cheaper products in the market first" is the rallying cry for many high technology companies. With the pace of technology development accelerating and consumers becoming more discriminating and having more choices, many high tech firms face the dilemma of accelerating new product development or losing out on an entire market segment. This was the case in a $1.6 billion division of a Fortune 100 diversified high technology organization.	p. 129-130
18	MTR Corporation Performance Consulting for Better Supplier Management	The MTR Corporation, a Hong Kong – based transportation company, is no exception. In recent years, major developments have induced the corporation to change; the development of new towns and rural areas around Hong Kong; a new airport express railway system; and railway station improvement projects.	p. 99

This client learning process involves the practitioner identifying the triggers, symptoms, and attention grabbers so that they can understand the organization's history, motives, actions taken, environment, and data. Triggers, symptoms, and attention grabbers are items that help the practitioner to articulate client criteria for intervention design and selection. Client criteria are often implicitly stated through the initial description of the problem and allow practitioners to understand what will satisfy the client needs at the most general

level. It also helps them to communicate in the organization's language. For example, in case 13 the symptom that was coded was a recognized lack of employee voice from all levels in the organization. The organization's leadership knew they were not operating effectively and competitively, this grabbed the leadership's attention. What triggered the organization to take action was the fact they were not currently at the top performance quartile of the industry. A practitioner could use the industry standard of top performance as a way to measure and communicate the value they add.

Initiating Principle 1

Client's attention. A performance consultant should demonstrate how the performance problem aligns with strategic goals. Establishing a connection between strategic goals and performance problems provides the consultant with an opportunity to gain and maintain the client's attention throughout the life of the project and builds creditability.

Triggers, symptoms, and attention grabber findings helped to deduce several principles that focus on client criteria for closing the performance gap. This initiating principle is necessary for the performance consultant to adhere to when building and maintaining a client relationship. A performance consultant should:

- Gain an understanding of the organizational situation through the eyes of the client. This perspective can provide valuable data points that serve as client criteria for the performance improvement initiative.
- Identify what gets the client's attention and what is a trigger for the client to take action.

- Learn and use the organization's language throughout the client learning process and in the identifying the performance problem. Using a common language throughout the performance improvement process allows the client to understand the value added by the consultation.
- Study the symptoms and what they are tangibly connected to inside and outside the organization and use this as a focal point for data collection.

The second finding revealed how organizations begin self-diagnosing and treating their performance problems; more specifically, what motivates the organization to take action to address a performance problem in the midst of other business needs.

Understanding how an organization self-diagnoses and attempts to treat a performance problem is important information for the performance consultant to know. Self-diagnoses and intervention actions can be the cause of additional problems that may need to be addressed. During the initial coding process it became evident that prior to consultation and analysis by a performance consultant, some stakeholders conducted some form of self-diagnosing regarding the performance problem. Table 10 provides examples of client self-diagnoses and in a few cases treatment. Self-diagnose includes the formulation of ideas as how to take action to address performance before analysis by a skilled practitioner. Some stakeholders went as far as to select a training intervention. This can be seen as a result of novices and clients self-remedying

and not taking a broader systems approach to diagnosing performance problems, not having a wide span of knowledge and experience of performance improvement, and a lack of expertise in an array of interventions. This tends to lead novices down the path of a single intervention or a solution that relies heavily on training and sometimes the introduction of a tool to solve a problem. A potentially rich area for future research in performance improvement could focus on industry regulations forcing training as an intervention.

Table 10:
Self Diagnoses & Treatment Annotations

Case #	Case Title	Annotation: Self Diagnoses & Treatment Finding	Page #
11	Pride in Public Service Oregon Department of Transportation	This uncertainty alone could have been enough to prompt us to provide employees with an ethics training module. As we were beginning to learn through our team development efforts successfully decentralizing decision making requires an ethical context for decisions. It was at this point that we decided to marry the two ideas and include an ethics component in our department-wide restructuring effort. The ethics package would include training on basic ethical responsibilities of public employees and decisions about the types of ethical situations they might encounter.	p. 167
13	Taking Measures Beyond Monitoring To Driving Performance	TRMI operates management believed additional efficiencies would be realized if they could gain total workforce commitment to improving performance on these measures. The challenge, then, was to influence the on-the-job behavior of a primarily unionized workforce to improve operational efficiency.	p. 121
22	Safety Problems Maverick Inc.	Ashton was most concerned about the high number of accidents being reported at maverick. The proposed project was approved and the consultant was hired. Ashton proposed that the assessment should investigate the accident rate and suggest possible training programs needed.	p. 35
23	Quality Skills Needs Assessment AER Inc.	Several factors led to the decision to conduct a needs assessment. After deciding to implement a quality initiative, the human resource department felt it necessary to identify training needs. Given limited resources, it was essential to find out what the true needs for training were.	p. 210

Initiating Principle 2

Client self-diagnoses and home remedy. A performance consultant should inquire about any prior self-diagnosis activity conducted by the client to address the performance problem. In addition to analyzing the performance problem be ready to evaluate any home remedies initiated by the client.

As a principle, a performance consultant should investigate any self-diagnoses and homemade remedies implemented by the organization during the initial relationship building and client learning process. Adherence to this initiating principle helps the practitioner to use what was done as an advantage instead of a hindrance. A performance consultant should:

- Identify any adverse events that resulted from client home remedies and ensure interventions are selected to address the additional problem.
- Build on any positive results of home remedies. Building on successful outcomes helps to create buy-in, limits redundant efforts, and helps to make the client initiative seem continuous to the end user.

The third initial finding identified data as a driving force behind the decision to select particular interventions. As shown in Table 11, data collection and analysis are critical to the performance consultant in the selection decision making process.

Table 11:
Data Driven Annotations

Case #	Case Title	Annotation: Data Driven	Page #
1	Improving Instructor Performance Western Digital	Another purpose of the interviews was to assess the attitudes of the potential instructors toward their roles as instructors and their levels of confidence. The interview revealed that all instructors recognized the importance of good training and wanted to do a good job. Three expressed concerns about their abilities to be good trainers, one was confident, and two were very confident. All instructors believed that it would not be necessary to spend time preparing for each class. They expressed the belief that knowing content was most important for success.	p. 211
9	Coaching Sales Performance: A Case Study	Results of this first phase of the needs assessment confirmed that the sales associates were troubled by their sales skills, confidence and perseverance. Many reported feeling left out, unsupported, and not encouraged to make calls and knock on doors in the face of frequent rejection. Ironically, just down the hall, many brokers from the offices of these same sales associates were applauding themselves for supporting and training their new associates. They admitted, however, after the presentation of numbers representing low production and high attrition, that they were not certain what to do to solve these problems. Brokers were not all equally eager to address the woes of a new associate. While they acknowledged that new people needed help, most didn't know what to do or didn't get around to doing it consistently. Table 3 captures some key results from this portion of the needs study. Results confirmed the suspicion that twenty-one training modules would not solve these performance problems.	p. 42

(table continues)

Table 11. (continued)

Case #	Case Title	Data Driven	Page #
20	Managing Employee Retention Through Recognition - Wireless Communications Company	The Employee Workplace Survey identified an opportunity to improve employee recognition within the company. The three different samples allowed a comparison among data points from 1998, 1999, and 2000, as well as benchmarking against industry-leading companies. The 54-question survey, which was randomly distributed to a small percentage of active employees, also provided valuable data about employees' trust in their managers, as well as other workplace attributes. The survey questions covered five categories: credibility, respect, fairness, pride, and camaraderie. These measured employee's perceptions about the quality of their workplace relationships-with management and other employees. The survey benchmark was composed of data from companies included on Fortune magazine's "100 Best Companies to Work for the America" list for 2000.	p. 20
22	Safety Problems Maverick Inc.	The assessor recorded the safety precautions taken, how the safety equipment was used, and all safety-related actions that she noticed while observing employees in the shop area. In one instance, she broke down one of the tasks to determine which particular step to steps appeared to be responsible for the excessive injuries. The observation notes were read and reread to find significant behaviors, event, patterns, or environmental flaws (such as old equipment) that could have contributed to the high accident rate. These findings were summarized and presented in the observation report.	p. 40

This study reconfirms the principle that data drives the selection of an intervention which is not a new concept in the literature on performance improvement. While individual interventions were selected as a result of analysis, none of the cases had an analysis that revealed a comprehensive group of interventions working together that uniformly addressed the performance problem in the case. This study challenges the idea that data analysis automatically reveals what groups of interventions to select as suggested by predominant models in the field. It is critical that data collection tools and data

analysis results be interpreted by a practitioner well versed in the performance literature, specifically in the case of multiple interventions being selected to address performance problems, because analysis provides answers to specific questions but not how to connect the answers to a comprehensive group of interventions.

Initiating Principle 3

Analysis and tacit knowledge work together. A consultant must appropriately and wisely balance the use of data resulting from analysis and tacit knowledge as they navigate the intervention set selection phase of the performance improvement process. The two types of knowledge should not be viewed as dichotomies, but as counterparts working together to energize the intervention set selection phase.

In general, the practitioner should continuously refresh and seek new literature on performance improvement research, theories, and case studies in order to expand their knowledge of the performance landscape and to make a meaningful interpretation and use of the data gathered. Adherence to this initiating principle will help the practitioner to achieve a comprehensive approach to intervention selection.

- Stay abreast of new and old diagnostic and process models.
- Regardless if practitioners are using extant data or data they collected, a comparison of interventions that result from the analysis against all the performance factors is required; that is connect the dots.
- Make an illustration of the connections in model form.
- Identify how each individual intervention reinforce one another and ascertain if there were any interventions that were overlooked in the

analysis process that would assist with reducing the performance gap. If the data collection was inadequate it is likely that the analysis may not yield enough information to reduce the performance gap.

- Performance improvement professionals should use their tacit knowledge of the literature base and experience to add value. That is, provide insight from the theoretical level not observed in the current data set but founded in the literature base of the discipline.

As the initial coding process showed there are patterns performance improvement consultants tend to follow when selecting interventions. Although the patterns identified took place before any actual intervention was selected, they were critical to the intervention selection decision making process. These patterns explain how the practitioner begins to learn about the client, how the client tried to address the problem with homemade remedies and data analysis results; all of which later aid the scoping process and inform the intervention selection decision making process. More patterns emerged after the initial coding process and are addressed in this findings chapter.

Finding 2: Intervention Sets Selection

In phase 1, the initial coding and data collection process, it was observed that there was more than one intervention in a case and that the interventions supported one another to reduce the performance gap. Focused coding in phase 2 resulted in the researcher examining the reinforcing characteristics of multiple interventions in a case. The connection of multiple interventions in a case were not explicitly outlined in the cases, but became apparent once the interventions

selected were visually represented in diagram form. Repeated observations of the same intervention behavior and reflection of the problem solving processes used by performance consultants reconfirmed the intervention connection observation. Table 12 provides examples of multiple interventions connecting in a single case.

Table 12:
Interventions Interconnectedness Annotations

Case #	Case Title	Annotation: Interventions Interconnectedness	Page #
20	Managing Employee Retention Through Recognition. Wireless Communications Company	As a means of offering unlimited accessibility to the new tools, the Human Resource Information Systems function created a recognition Website, which allowed managers and employees to access a variety of recognition tools and resources offered by the Employee Recognition Program.	p. 24
10	Analysis for Training in an Organization Implementing ISO-9000 Manufacturing Practices: A Case Study	Therefore, the chemical department manager determined that the first step in the orientation project was to redesign the standard operating procedures and to train current operators on the procedures.	p. 50
12	Strategic Performance Measurement The Case of Mississauga Transit	As can be seen in figure 3, strategic initiatives were developed, which were then aligned with the performance measures. This gave management a tool that allowed them to monitor progress toward a common organizational goal. Without such a process it was difficult to evaluate how successful the organization had been. Further, it established a system that helped drive organizational improvement within the involvement of all employees.	p. 24
2	Performance Management Training Yellow Freight System	The proper resources were obtained to ensure the program's success. Job aids were used during training to speed up performance to criterion and as observers' checklist for recording and guiding feedback. After training, job aids were used to help trainees use the skills correctly, without relying on recall from memory.	p. 261

The fourth initiating principle is divided into two parts. 4a focuses on the role of a performance consultant as an interconnected entity within the organization and the performance improvement process. While 4b focuses on the cross-functional nature of a performance consultant in the intervention set selection process. Both principles have similar characteristics but are distinct enough to be presented as unique principles.

Initiating Principle 4a

Interconnectedness. A consultant should act as an orchestra leader. To do this the consultant must be interconnected to people, networks, and ideas within and outside of the client organization. Consultant interconnectedness goes beyond general knowledge and awareness of these entities. Consultants should immerse themselves into these environments in order to assure that the selected intervention set ultimately fits into the current and evolving new environment. If the consultant is not interconnected they can potentially select an intervention set that quickly becomes obsolete because it does not fit within the environment.

No intervention is an island. Interventions are connected and very rarely does an intervention stand on its own to reduce a performance gap (Pershing, 2006, p.23). It would be similar to building a bridge with only a pile of wood and nails without blueprints, or a team of workers. As a principle it is the practitioner's responsibility:

- to be knowledgeable about how performance factors are connected by being well grounded in multiple disciplines.
- to identify connections between interventions and the characteristics of each relationship.

Initiating Principle 4b

Seek internal and external cross-functionality. A consultant must work across disciplines, departments, and industries to select an intervention set that is comprehensive. Cross-functionality allows an intervention set to generate support and buy-in utilizing the knowledge base from other disciplines so that the set gains traction within the organization. Cross-functionality means more than just having the right people in room and diverse of idea on the table. It involves a deeper understanding of how cross –functional intervention sets impact performance. It requires conscious and deliberate connections between ideas and people. The consultant should be viewed as a creditable connector and selector of intervention sets that need to be implemented.

A consultant must work across disciplines, departments, and industries to select an intervention set that is comprehensive. Cross-functionality allows the intervention set to generate support and buy-in from the knowledge base of other disciplines so that the set gains traction within the organization. Initiating principle 4b builds on other principles in that it requires the consultant to now focus on a range and span of control of the intervention set versus the depth and expertise required in previous principles. A consultant should be willing and able to venture outside of their comfort interventions to explore possibilities. In the case by Jimenez (2002) titled “Managing Employee Retention” the principle of cross-functionality is well demonstrated. For example, “Representatives from all functional areas of HR provided various levels of support for the initiative, ranging from generating ideas and benchmarking to designing, implementing, and communicating the various components of the initiative” (p. 23). The authors go on to explain why cross functionality was so critical in this case,

> In a large HR department there are many initiatives focused on a variety of workplace and management improvement issues. Communication between functional areas and cross-functional teams is imperative to reduce redundancy within the organization. To execute the

> recommendations most efficiently, the HR department needed to unite the efforts of the various initiatives relating to retention and recognition. (p. 26-27)

A consultant adds value to a project in several ways by implementing the cross-functionality principle. First, cross-functionality deeply ingrains the intervention set into the organization, reduces redundancy, diminishes misalignment at the strategic level, and allows the implementation of the intervention set to be more easily adopted by an organization that operates in silos. The principle of cross-functionality requires the consultant to:

- stay abreast of the latest research and best practices in a variety of areas;
- maintain an extended network inside and outside the field of performance improvement;
- maintain a sense of curiosity to make connections on a theoretical bases in a variety of areas;
- transfer theoretical understanding from one area or function to another to address the problem at hand; and
- communicate across multiple disciples, industries, departments, and so on.

The advance memoing and refining conceptual categories of Phase 2 provides more explanations behind the interconnectedness principle. It also introduces an intervention schema to illustrate elements of the emerging conceptual category.

Advanced memos refining conceptual categories

Focused coding and advanced memoing refined conceptual categories. The refining of conceptual categories generated theoretical memo writing and were further refined as a major conceptual category. During the refining process of the connection category it was observed that multiple interventions worked as a group or incorporation to reduce the performance problem. Memos were generated by the researcher that provided explanatory power and dimensional range for groups or combinations of interventions as shown in Table 13.

For example, an organization can develop a new program to address a performance problem such as in Case #7 by Rekomd (1998). The new program is considered an independent intervention because its existence is not dependent on another intervention. However, other interventions are dependent on dominant interventions in order for them to effectively be implemented, such as training and job aids needed to support the new program. Case #1 by Payne (1994) is another example of an independent intervention where a new procedure would require the implementation of training and a job aid to support the procedure.

Table 13:
Concept of an Intervention Group Combination

First Order		Third Order -
Single Intervention	→	Group Intervention
Behaves independently	→	Behaves dependently
Reactive	→	Inactive
High transformation power	→	Low transformation power
Linear	→	Depth dimensional
Stagnant influence	→	Reverberating influence
One way direction	→	Two way direction

Some of the interventions came about as a result of a reaction to other interventions. For example, a job aid being created as a reaction to a new tool being introduced. While others were inactive, meaning that no additional intervention was needed to support the intervention, such as the hiring of a worker with specific a specific type of educational background or physical attribute. Transformation power was noted as the impact that combinations of interventions had on changes in the organization. For example, a new strategic goal would have a high transformation power such as in Case #2 by Zigon (1994). Whereas the introduction of a checklist would be considered as having low transformation power such as Case #5 by Finnegan (2000). Some individual interventions triggered the need for other performance factors which made the set look linear in form such as in Case #9 by Strayer and Rossett (1994). For example, a new organizational goal focused on improving the coaching system may trigger a new coaching system, which would then trigger the need for additional skill and knowledge for future workers.

Linear form: New coaching identification process → new coaching compensation system → new coaching workshop sessions

Others had in-depth extensions that connected to other interventions addressing the same performance factor yielding a depth of dimensions. For example, in Case #10 by Kunneman and Sleezer (2000) the redesign of standard operating procedures required the establishment of a formal orientation program to allow organizational goal to be realized.

Depth Dimension form:

Redesign of standard operating procedures

↓

Formal orientation program

When interventions are arranged as a combination, they tend to have a reverberating influence on more than one performance problem in the organization such as in Case #4 by Whalen (2000). In this case there was poor customer satisfaction that required a combination of interventions that included, setting new goals, providing training, adjusting communication, and providing a new tool to address the problem of poor customer satisfaction and indirectly improve employee work engagement. Single interventions tend to have a stagnant influence in an organization; for example, a single intervention where employees are only required to adhere to a new incentive system without the organization changing goals or providing new skills or knowledge on how to be successful within the new incentive system. It emerged that a higher order intervention can be directed towards a lower or lesser order intervention to reduce the performance gap which is considered as a one-way relationship. For example, in Case #7 by Rekomd (1998) a new software program is a higher order intervention that is directly related to training on the new software. The training would not exist without the new software. However, there are instances where the relationships between interventions in a group have a mutual relationship which is referred to as a two-way direction. Meaning that without one or the other the performance gap would not be closed. For example, in Case #20 by Jimenez (2002) an organizational goal of increasing employee voice has a mutual relationship with an effective employee feedback system. During the

theoretical sampling phase of the study, specific new data were sought to further observe the concepts above.

Theoretical samplings seek specific new data (Modeling)

Refined memos made it easier to identify the “presence or absence” of concepts when new specific data were sought through theoretical sampling (Goulding, 2002). After each case intervention combination was depicted as a model, the researcher went back to the cases seeking supportive new data. By conducting analysis among and between the cases and illustrating the interventions in a model form, the concept of an intervention set was initially observed. Modeling the cases resulted in the concept of an intervention set being further refined including its properties and dimensional range. The phrase intervention set is used as a descriptive category to explain the interactions of interventions working in combination that emerged from the data. While the concept of an intervention is alluded to in the literature, there is a lack of explanation on what an intervention set is and how it works.

Revisiting the literature

The literature review presented in chapter 2 was expanded after the initial data collection started as suggested by the grounded theory method. At this point in the study it was important to revisit the literature so that fundamental literature could be woven into the theory as more data were constantly compared (Dunne, 2011).

Gilbert (as cited in Stolovitch & Keeps, 2006) argues that, “To achieve valued accomplishment means analyzing all of the costly behavior elements and designing an integrated set of interventions that most efficiently generates desired and measured results” (p. xvi). There is no additional literature on how to accomplish the goal of selecting an intervention set. Although Gilbert does not elaborate on the concept of an integrated set of interventions, others in the field such as Broad (2006) and Whiteside (1997) follow the same line of thought. Broad (2006) states, “A combination of interventions is necessary to lead to desired performance and results” (p.325). The theoretical foundation of the field also alludes to this idea; however, it provides limited explanation of how and why interventions work as a set. Systems and field theory present some insight on the idea that a combination of interventions is needed to address performance gaps; however, no information is provided on how combinations of interventions are selected and for what reasons. Therefore, a more appropriate word is needed to meet this void in the literature that accounts for the integrated and connected nature of interventions as a *set* or the term *intervention set.* Referring to more than one intervention working together as a set is more appropriate than simply changing the word intervention into its plural form interventions because it takes into consideration how each intervention within the set works in coordination with others to bridge performance gaps. The word *set* has several meanings, however, both the noun and verb form of set are compatible with the HPT literature. As a verb, *set* means:

> …to place in some relation to something or someone: *We set a supervisor over the new workers…*to adjust (a mechanism) so as to control its performance…to fix at a given point or calibration…to cause to take a particular direction. (Dictionary.com online dictionary, 2010)

As a noun, *set* is referred to as:

> …a collection of articles designed for use together: *a set of china; a chess set*…A collection, each member of which is adapted for special use in a particular operation: *a set of golf clubs; a set of carving knive*s. (Dictionary.com online dictionary, 2010)

As noted, in seeking a more precise word or term to explain the relationship between various interventions that are intentionally selected to bring about a change in performance, this study uses the term *intervention set*. It adequately describes the collection of interventions used as a cohesive whole to address performance gaps. Now that the definitions of an intervention set has been examined, it is necessary to turn attention to refining how intervention sets are selected and why, so that the voids in the literature about the process of intervention selection can be reduced.

Refining Concepts and Theoretical Concepts

The concept of intervention set was combined with the central phenomenon intervention selection to make the core category, *intervention set selection*. As noted by Corbin and Strauss (2008), a core category is defined as a:

> Higher-level concepts under which analyst group lower-level concepts according to shared properties. Categories are sometimes referred to as themes. They represent relevant phenomena and enable the analyst to reduce and combine data. (p. 159)

Before a description of the core concept of definition of intervention set selection is presented it is necessary to include prerequisite principles for intervention set selection.

Prerequisite Principle 1

Acquire practical experience. Novice consultants should begin by practicing on small performance improvement projects and by reading the work of more seasoned professionals in order to start acquiring foundational schemata. The combination of education and real world practice can vary; however, the goal is for the consultant to be well grounded in both applied research and practice. After a consultant has many years of experience and an advance degree in performance improvement, they must stay abreast of new research and additions to best practices as well as actively engage in professional associations. This is important so that experienced individuals do not become stuck in the habit of operating without incorporating new and improved methods, which in turn can render their practice stagnant.

Novice consultants should begin by practicing on small performance improvement projects and by reading the work of more seasoned professionals in the field in order to start acquiring foundational schemata. Once they have some practical experience, they should seek certification to validate their ability to conduct performance improvement. In his book, *Outliers* (2011), Malcolm Gladwell argues that to be considered an expert, an individual must dedicate years of practice to refining their craft. Gladwell's idea of dedicated practice over time is known as the 10,000 hour rule and refers to an individual acquiring at least 10,000 hours of correct practice on a particular skill. A consultant can acquire performance improvement experience and practice in a variety of ways. For example, a consultant can acquire experience through pursuing a graduate degree focused on performance improvement and then spend seven to eight

years in the industry refining their practice. Or an individual might pursue a PhD in the area of performance for four to seven years and then spend three to six years practicing in industry. The combination of education and real world practice can vary; however, the goal is for the consultant to be well grounded in both research and practice.

For example, the authors of the cases in this study have experience through both formal education and through practicing performance improvement in the field. Most of the case studies provide brief biographies of the authors to illustrate the level of practice the individual has demonstrated throughout the years. For example Van Rekom (1999):

> Petti Van Rekom…is responsible for performance improvement interventions for accompany wide knowledge management project. Her 20 years experience in the field included instructional design and management of training projects from several corporations. She is a former president of the Orange County chapter of the International Society for Performance Improvement and a speaker at conferences on technology and learning. She received her bachelor's degree (1964) in international relations and economics from the University of California, Las Angeles; her master's degree (1975) in education from California State University, Los Angeles; and has completed her coursework for a doctorate in human performance at work from the University of Southern California. (p. 217)

Jimenez's (2002) case provides another example:

> Rick Jimenez, staff employee communication specialist, works in the employee communications group of a Fortune 500 wireless communications company. As part of the HR department, employee communications facilitates communication within and across the entire company. Jimenez led the corporate retention initiative by managing the employee surveys and uniting the HR department's retention efforts. His responsibilities also include managing live face-to-face communication opportunities, developing and implementing corporate and division messaging, and designing culture surveys. He holds a Bachelor of Arts degree in journalism from California State University, Chico... (p. 27)

The case study by King (1998) provides an author's biography showing academic and professional association experience in the field:

> Stephen B. King is a Ph.D. candidate in Workforce Education and Development at The Pennsylvania State University...His research focuses on the competencies associated with the role of the HPI analyst. Prior to graduate school, King held a variety of positions in a Fortune 500 manufacturing organization. He has presented at the International Society for Performance Improvement and the American Society for Training & Development's international conferences and has several publications related to training and performance improvement. He holds a B.S. in business administration and an M.A. in adult education from the Ohio State University… (p. 125)

Strayer and Rossett (1994) presents biographies of both authors illustrating the amount of practice the authors have had over the years:

> JENNE STRAYER, Director of Performance Design at Century 21 Real Estate Corporation, leads a team of performance specialists who provide training and other performance improvement assistance to the company's franchise operations. Jeanne has a Masters Degree in Educational Technology from San Diego State University. ..
>
> ALLISON ROSSETT, Professor of Educational Technology at San Diego State University, is a consultant in performance and training systems. She was the NSPI Vice-President for Research and Development from 1988-90 and has authored articles on training and technologies and two award-wining books…(p. 53)

This principle also maintains that even after a consultant has many years of experience and an advance degree in performance they must stay abreast of new research and additions to best practices as well as actively engage in professional associations. This is important so that experienced individuals do not stuck in the habit of operating without incorporating new and improved methods, which in turn can render their practice stagnant.

Prerequisite Principle 2

Acquire expertise and when lacking seek collaboration. A performance consultant must acquire subject matter expertise in at least one phase of the performance improvement process. The consultant should be honest with themselves and the client about their skill level. When the consultant lacks needed expertise they should collaborate with an expert to supplement the lacking skill required for the intervention set to be executed in the organization.

Collaboration and subject matter expertise are presented as a part of the same principle in this study because consultants should rely on partnerships in situations in which they are not experts. This allows them to draw upon others' strengths to identify and achieve desired results. For example, in the case by Wykes, March/Swets, and Rynbrandt (2000) titled, "Performance Analysis: Field Operations Management Steelcase Inc." a team approach to the performance problem was used to capitalize on expertise.

> The performance analysis and consulting group is comprised of a leader/manager, several performance consultants, and two performance analysts who report to an organizational entity within the corporate quality function. This group was under the HR function at the time of the case study.
>
> Within this team, the performance consultant (called "consultant" in this study) provides face-to-face, ongoing contact with internal clients, while performance analysts ("analysts") provide primary performance analysis support and human performance technology expertise. (p. 136)

Collaboration is not a new idea in performance improvement literature. Spitzer (1999) discusses the concept of collaboration in intervention development by stating, "*High-impact interventions should involve the right people in the design process"* (p. 178). What is not thoroughly discussed is the connections between a consultant's subject matter expertise and the collaboration process. It is nearly impossible to have a deep expertise in all aspects of performance

interventions (Van Tiem, Mosely & Dessinger, 2004; Spitzer 1999). While organizing and project management are core skills a consultant must possess, a consultant must be grounded in all aspects of the performance improvement process, such as analysis, design, development, implementation, and evaluation.

The more expertise consultants can acquire, the more it enables them to see the intricacies of the systems into which the intervention set will be implemented. Having deep expertise expands the selection options available to the consultant and enables them to see further into the possibility of the intervention set because it widens their ability to see systemically. Perfecting a specific niche area where there is limited expertise enables the consultant to add value. A consultant should also have deep expertise in a particular industry or culture as well as a few interventions they have mastered. If subject matter expertise is not acquired, the consultant runs the risk of simply taking orders from the client, which diminishes the value they bring to reducing the performance gap. As suggested by Pershing (2006) the performance consultant should serve as an orchestra leader who organizes the many moving components but be able to focus attention on particular parts of the process if there is a problem.

The Wykes, March/Swets, and Rynbrandt (2000) case used collaboration within the organization to accomplish tasks. The following excerpts show specific areas in which collaboration added value.

> To accomplish this, the consultant and analysts facilitated several meetings with the vice president, the FOM leader/manager, and other FMC leadership to identify result areas (critical responsibilities and valued accomplishments for the FOM job), competencies (those core competencies critical to the FOM job, such as economic orientation and planning), best practices (what the best performers were doing to

> consistently achieve results), measures (the clear business and performance measures that were needed), and barriers and enhancers (those factors that were impeding or helping FOM performance). (p. 140)

As shown above, collaboration allows for consultants to identify and engage the right individuals in the project at hand. It also helps specific individuals to focus on their area of expertise. More importantly, collaboration offers the consulting team an interpreter to guide them through the organizational nomenclature and structures.

Intervention Set Selection A Working Definition

Through memo writing the following initial definition of *intervention set selection* formed. Intervention set selection is the process of strategically choosing a group of purposeful actions that address a related performance factor deficiency. Each intervention within the set works complementary to the other to reduce or close performance gaps. The process occurs after the initial performance analyses phase and takes place in tandem with the design and development phases of the performance improvement process. The process involves manipulating each intervention within a given set so that each is calibrated with others in order to obtain optimum performance and to build the power of the set as a cohesive unit. The selection of intervention sets can include the selection of multiple smaller intervention sets to make-up a more complex set. The quality of the final selected intervention set is dependent on time and the skill of the consultant. As suggested by the performance improvement design and development literature, calibration is achieved through a series of rapid

prototyping cycles (Wedman & Tessmer, 1990). Complete equilibrium and finality is rarely achieved because of time constraints and varying skills of the consultant. As a result, a consultant should communicate intervention set selection in terms of reducing a performance gap versus completely closing it. Contrary to Watson's (2010) suggestion that the goal of intervention set selection is to arrive at the smallest number of interventions, this definition argues that, regardless of size, it is the most effective and efficient combination of interventions that can maintain equilibrium within a system that is the most desirable.

The performance factors mentioned in this definition comes from the factors outlined in Wile's (1996) work, which include: organizational systems, incentives, cognitive support, tools, knowledge and skill, physical environment, and inherent ability. This definition of intervention set selection is informed by both general systemic thinking and diffusion of effect. To explain the process of intervention set selection in its entirety and to provide a foundation for a substantive theory, intervention set schemata are provided.

Finding 3: Six Schemata Elements of Intervention Set Selection

The field of performance improvement has numerous process and diagnostic models that provide how-to-knowledge in identifying critical concepts and procedural tasks. These models enable practitioners, typically novices, to apply these core concepts and tasks in the field. D'Andrade (1995) states:

> …many models are not schemas themselves, although they are composed of schemas. Models are not schemas when the collection of elements is too large and complex to hold in short-term memory (by

> definition, a schema, as a "bounded, distinct, and unitary representation," must fit into short-term memory). (p. 152)

The development and examination of schemata takes into account "nondeliberate" or unconscious "availability of choices" and the knowledge that advanced performance consultants acquire via repeated experiences and practices that are acted on automatically (Mandler, 1984, p. 61). This study takes consultants' experiences that have become automatic and presents them as schemata to explain how this approach to thinking about intervention selection is central to the intervention set selection process.

Thorndyke and Yekovich (1979) notes that it was Immanuel Kant that first brought schemata into the literature and "developed the idea that people's experiences are collected together in memory and that these collections are defined by common elements" (p. 4). The idea of schemata was further refined by scholars such as Piaget (1926) and Barlett (1932) in the areas of cognitive structures and recall. Thorndyke and Yekovich (1979) provides five properties that underlie schemata. These include:

- Concept abstraction or the "prototypical abstraction of the concept it represents"
- Hierarchical organization which refers to how "Schemata are organized into a generalization hierarchy in memory"
- Instantiation which come in the form of "variables, or slots, that can be filled whenever the schema is used to organize incoming information"
- Prediction or the ability of a schema to "permit reasoning from incomplete information. This reasoning takes the form of expectations

about information we expect to obtain to fill slots in the currently active schema”

- Across case analysis, Induction or the process of schema refinement over numerous experiences with “…exemplars of the generic concept”. (pp. 8-11)

Through across case analysis, six different schemata for intervention sets with individual guiding principles were developed and used to shed light on the intervention set selection process undertaken by performance consultants.

Composition Schemata

The composition schema is the first and most essential of the intervention set schema. The composition schema refers to how many interventions are involved in closing a performance gap. That is whether there is an intervention set or a single intervention. See Figure 11.

It is possible, although rare, that a single intervention can close a performance gap; however, knowing and being able to recall the composition schemata is the first cognitive structure that a consultant has to identify in the selection process. A single intervention can be simply introducing a new organizational goal. However, simply developing goals will not be all that is needed for those goals to be realized. As observed in Case #13 by St. Clair and Sharp (1998) the intervention set focused on all the supporting interventions that need to be selected to support the achievement of the organizational goal.

Single Intervention	Intervention Set	

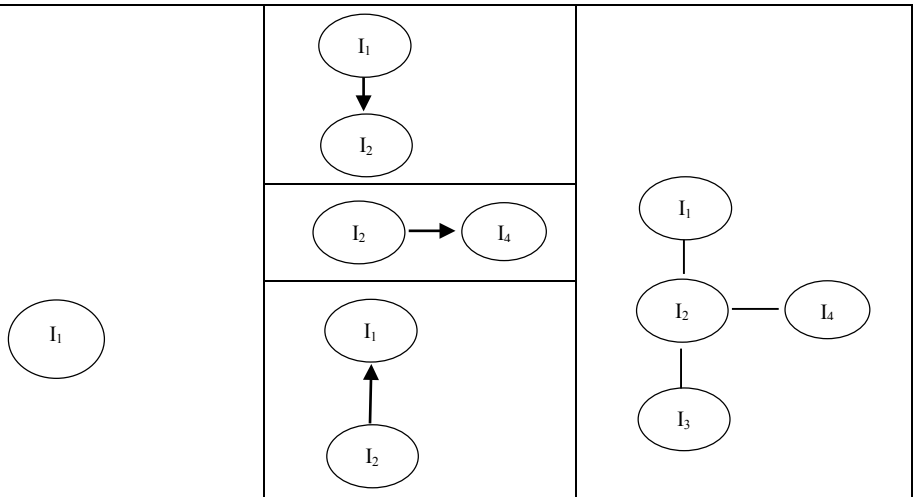


Figure 11. Composition Schemata. This figure illustrates a single intervention and intervention sets. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3. I_4 Intervention 4

Figure 11: Composition Schemata

See Figure 12 to examine the intervention set in case 13. By drawing on a composition schemata and a systems mindset a consultant is prompted to think differently about interventions, even if the analysis reveals that an organization lacks goals.

Composition schemata can be visualized in a number of combinations with varying performance contexts. This multitude of possibilities generated further intervention set schemata as well as permeating interventions set schemata principles. Permeating principles 1a revolves around the idea of intervention sets as having a systems characteristic embedded into its composition. 1b goes deeper to focus on the consequences of each intervention and the set as a whole. Permeating principles 1c takes on a more ethical emphasis, prompting the performance consultant to reflect on the responsibility they have for the impact of the intervention set selected.

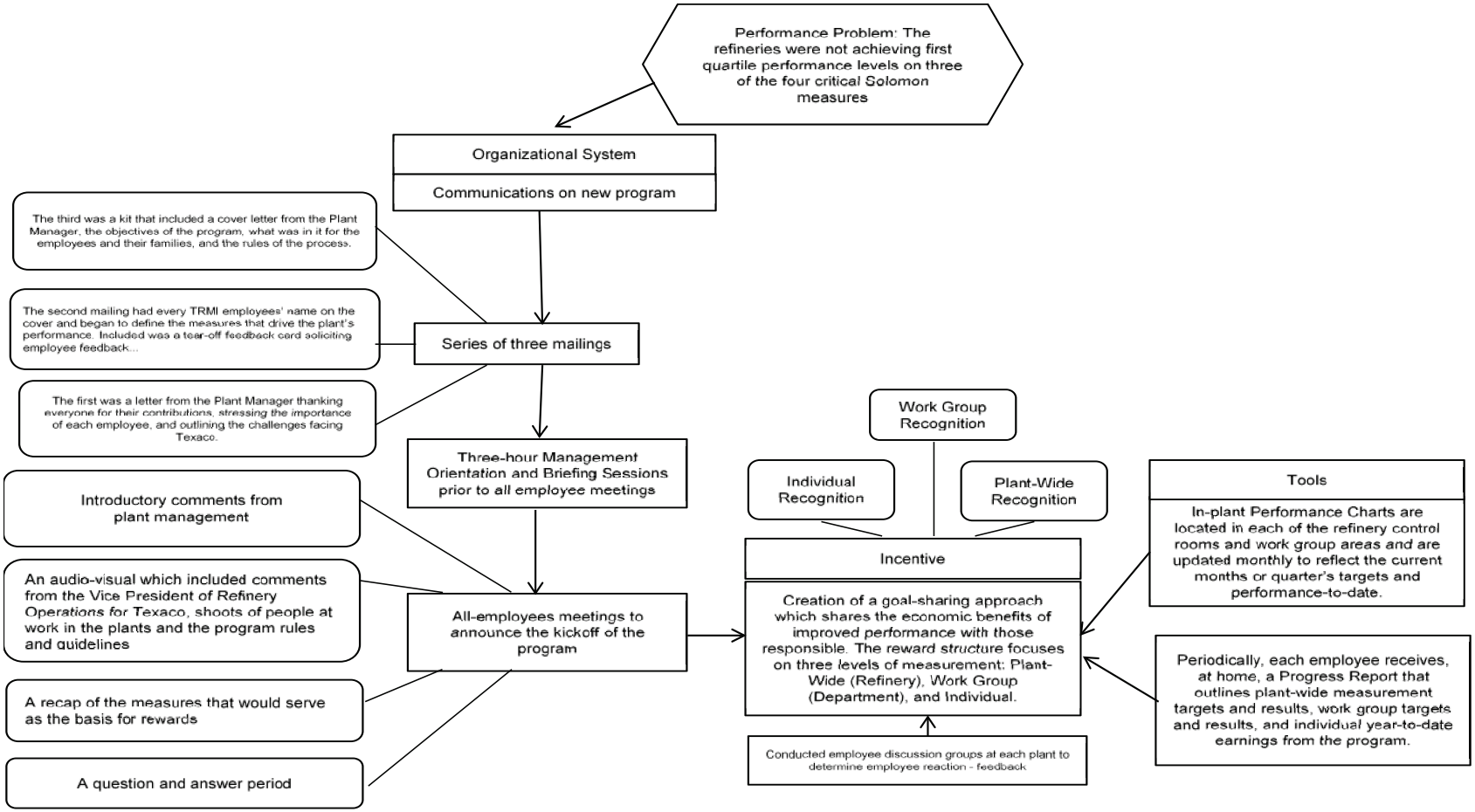


Figure 12: Case 13 in Model Form

From, "Taking measures beyond monitoring to driving performance," by S. St. Clair & J. Sharp. In T.J. Esque & P.A. Patterson (Eds.), 1998, *Getting results: Case studies in performance improvement* (Vol. 1, pp. 119-128). Amherst, MA: HRD Press.

Permeating Principle 1a

Intervention set systems perspective. A systems mindset needs to permeate the intervention set selection process. The consultant should pay special attention on what binds each intervention together as a set, how the complete set works together as one unified set, and how the set functions within an organization. A systems mindset during the intervention set selection process allows the analysis to be optimized through the use of schemata.

As a principle a consultant should take a systems perspective to identify whether the performance gap requires a single intervention or a set of interventions to reduce the performance gap. An analysis may result in a single intervention as the root cause of the performance problem, but the composition schema helps the consultant to see the system that revolves around that single intervention and to make a determination if the performance problem requires a single versus a set of interventions. The composition schema is useful because the analysis informing the intervention selection process may not have been conducted by the consultant and may not have been thoroughly completed. Analysis questions are critical to the intervention selection process because they frame the thinking about the possibilities of intervention. If the analysis is done haphazardly or by a novice it can have a limiting effect on the comprehensiveness of the intervention set selected (Pershing, 2006). A systems mindset should guide the decision to choose single versus a set of interventions. As noted in the literature review a systems views requires the consultant to focus on the arrangement of properties within a system and now these properties work together as a whole (Bertalanffy, 1972; Brethower, 1999; Rosenberg, 1999;

Girard, Lapides & Roe, 2006). Systems thinking tends to fall into the performance literature that is focused on the performance problem analysis; however, this study contends that system thinking is essential to the intervention selection process and is done unconsciously by expert consultants when analyses are lacking. Thinking with a systems perspective expands a consultant's view of the possible interconnectedness of interventions to reduce a performance gap. The implementation of systems thinking during the intervention set selection process allows the analysis to be optimized. Table 14 provides annotation from several cases that show systems thinking taking place in selection of an intervention set.

Table 14:
System Perspectives Annotations

Case #	Case Title	System perspectives	Page #
1	Improving Instructor Performance Western Digital	First, the human performance technologist prepared and distributed to all QIS team members a complete job description for the instructor role. In a team meeting, the project head reviewed the job description and encouraged team members to volunteer to be instructors, all instructor candidates were required to attend a Train-the-Trainer course and pass a certification test.	p. 212
12	Strategic Performance Measurement The Case of Mississauga Transit	Senior management was also involved in system development; that group defined the goals and priorities of Transit, which ensured that the system was properly focused on key areas that would generate significant results. Also, the development of performance measurement dashboard framework helped provide the link between objectives and measures and gave management a tool to monitor progress and identify any necessary improvements.	p. 20
13	Taking Measures Beyond Monitoring To Driving Performance	The environment was prepared for the implementation of the process through the use of management/supervisory orientations and communications. Prior to the announcement of the program, every employee received a series of three mailings at their homes:	p. 124

Directional dependence schemata

Interventions are not optimized when selected in isolation. Similar to the composition schema is the dependence schema which explains the linkage and direction between interventions within a set. As show in Figure 13, the directional dependence schema provides the consultants with depth and direction when systemically thinking about an intervention set. Intervention sets with depth provide a more stable approach to performance improvement because they are supported by other interventions that impact the performance factors. The directional aspect of this schema helps to think about other possible performance factors that may be at play. While this may seem logical, the concept can elude a novice resulting in an ill structured intervention set. All of the cases analyzed in the study had evidence of the directional dependence schemata.

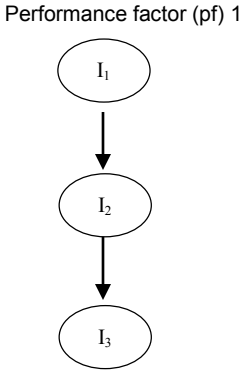
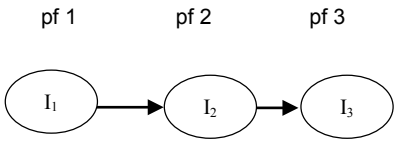
Dimensional Set	Linear (Horizontal) Set
	

Figure 13. Directional Dependence Schemata. This figure illustrates a dimensional set and linear (horizontal) set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3. pf 1 Performance factor 1. pf 2 Performance factor 2. pf 3 Performance factor 3.

Figure 13: Directional Dependence Schema

A directional dependence schema is a dimensional view of intervention sets, meaning that one intervention within the same performance factor category may need other lower order interventions within the same performance factor to tighten the performance gap closure. The schema can be linear or horizontal, meaning that the interventions within the intervention set can cut across performance factors but still need each other to reduce the performance gap. A training intervention is dependent on a higher order intervention within a performance factor such as an organizational goal, new procedure, or new program. Therefore intervention sets have dependent relationships within the set with one high order intervention that begins the dependence chain. For example, in Case #10 by Kunneman and Sleezer (2000) two of the interventions dealt with organizational system performance factor; that is, redesign the standard operating procedure and then establish a formal orientation program for current and new operators. These two interventions fall under the same performance factor but the latter, “establish a formal orientation program for current and new operators” is dependent on the former “redesign the standard operating procedures”. The other intervention in the set is focused on the skill and knowledge performance factor “train current operators on procedures”; this intervention is dependent on the establishment of the formal orientation program. See case model diagram in Figure 14.

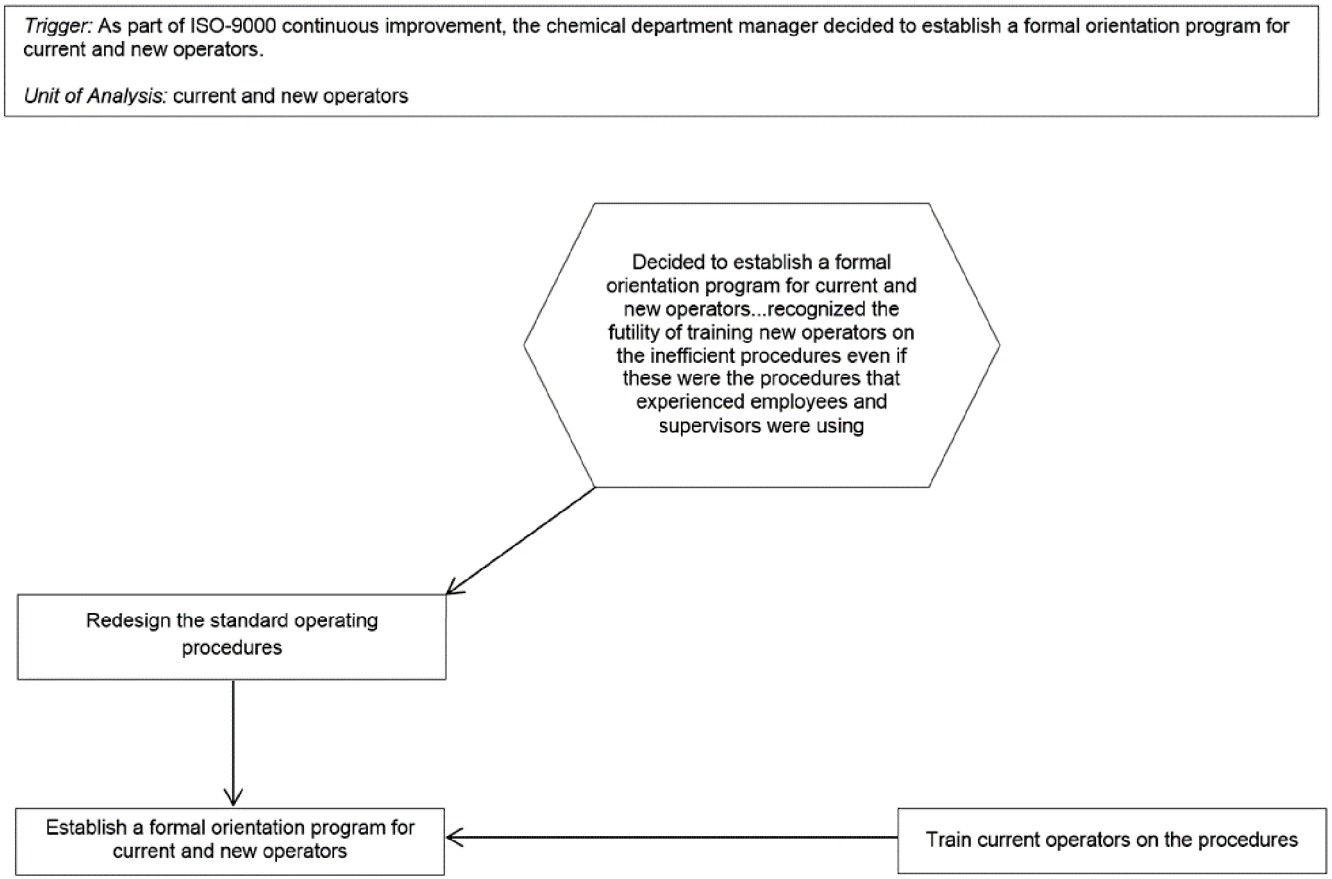


Figure 14: Case 10 in Model Form

From "Using Performance Analysis for Training in an Organization Implementing ISO-9000 Manufacturing Practices," by Dale E. Kunneman & Catherine M. Sleezer, 2000. In Performance Improvement Quarterly, (13) 4, 47-55, 2000

Mechanism of action schemata

Mechanism of action schemata provide an activation view of the intervention set selection process (See Figure 15). An analysis may result in one or two specific interventions being selected; however, a skilled consultant relies on their mechanism of action schemata to fill in the gaps in the analysis to form an intervention set. A consultant is able to use their experience and theoretical understanding of given interventions to see the connections between interventions that are not visible from the analysis alone. One intervention can activate the need for two or three interventions that were not directly identifiable from the analysis.

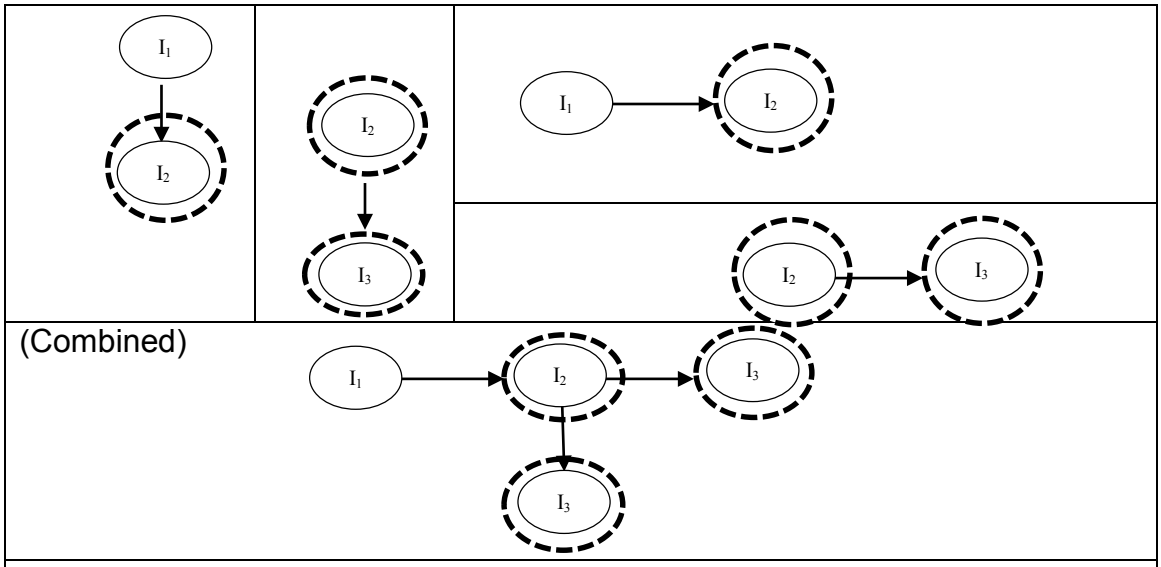


Figure 15. Mechanism of Action Schemata. This figure illustrates a vertical, a horizontal, and a set mechanism of action set. I_1 Intervention 1. I_2 Intervention 2. I_3 Intervention 3. pf1 Performance factor 1. ◌ mechanism that activates a connection between another intervention

Figure 15: Mechanism of Action Schemata

For example, in case #9 by Strayer and Rossett (1994), the interventions that resulted from the analysis were:

1) A commitment to a coaching model

2) New job design

3) Coaching selection process

4) Coaching compensation system

5) Menu of alternative compensation

6) Structure coaching session

7) Workshops for coaches

8) Coaching guides

9) Feedback resulting from coaching

10) Self-study training

11) Sales associate guide

The coach selection instrument intervention did not come from the analysis. The analysis resulted in an intervention that focused on designing a coaching identification system. This study contends that a skilled consultant in this case used their activation schema which enabled them to see that simply designing a coaching identification process was not enough to reduce the performance gap. An additional tool would have to be selected as an intervention and in this case it came in the form of a 15-item coach selection instrument. See Figure 16 for a model form of the case.

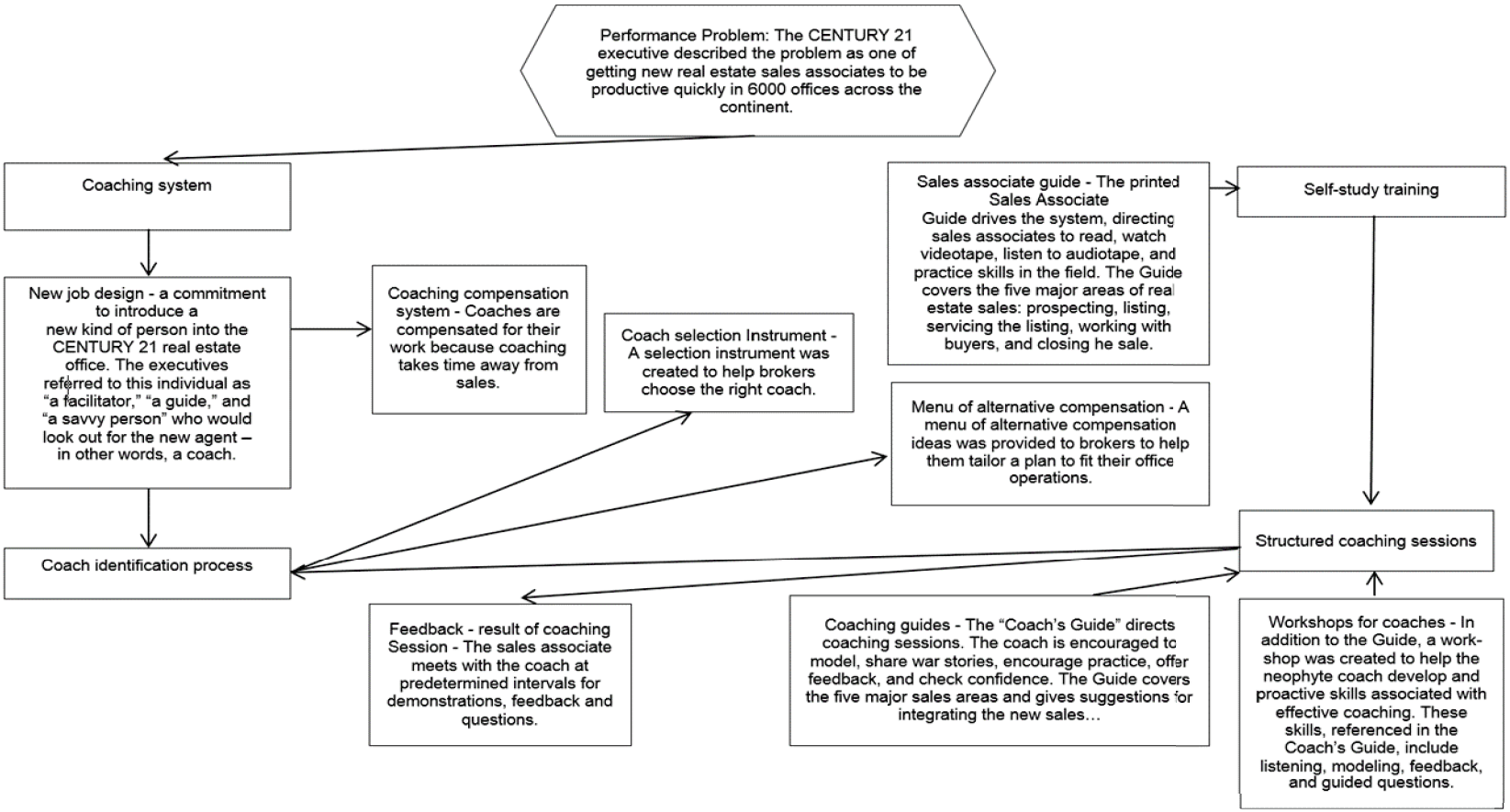


Figure 16: Case 9 in Model Form

From "Coaching sales performance: A case study," by Strayer, J., & Rossett, A. (1994). *Performance Improvement Quarterly*, 7(4), 39-53.

Enforcement schemata

Enforcement schemata allow the consultant to quickly see what interventions are susceptible to failing if selected in isolation. A skilled consultant would be able to decide if a single intervention is vulnerable and needs reinforcement from another intervention within the same performance factor category or another. Enforcement schemata build on the dependence aspect of the directional dependence schemata previously mentioned, but they are different in that the enforcement schemata can be one-way or two-way directional; that is cyclical. See Figure 17. When interventions in a set reinforce one another, the set is a tighter combined force.

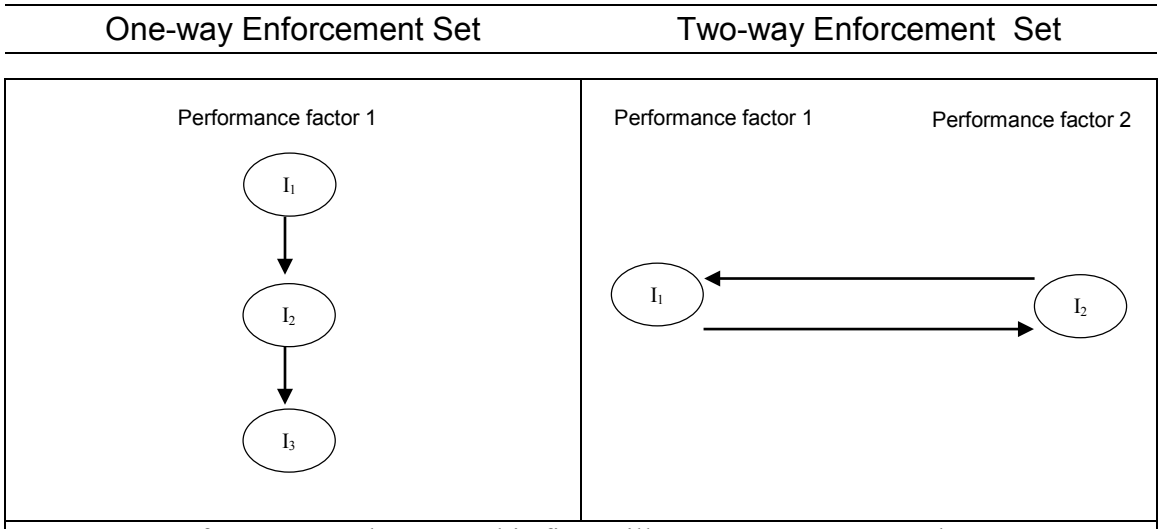


Figure 17. Enforcement Schemata. This figure illustrates a one-way and a two-way enforcement set. I_1 Intervention 1. I_2 Intervention 2. I_3 Intervention 3.

Figure 17: Enforcement Schemata

For example, in the King (1998) case #3, two-way enforcement was exhibited in the intervention set. The interventions that were identified were:

1. Major change in organizational strategic direction
2. Job redesign of the changeover process was conducted
3. Established goals and standards
4. Different or modified tooling and equipment to make the changeover
5. Instant feedback
6. Posting a bulletin board for feedback

In this case, the established goals and standards intervention was enforced by the instant feedback intervention. The instant feedback intervention in return was reinforced by the bulletin board intervention. See Figure 18.

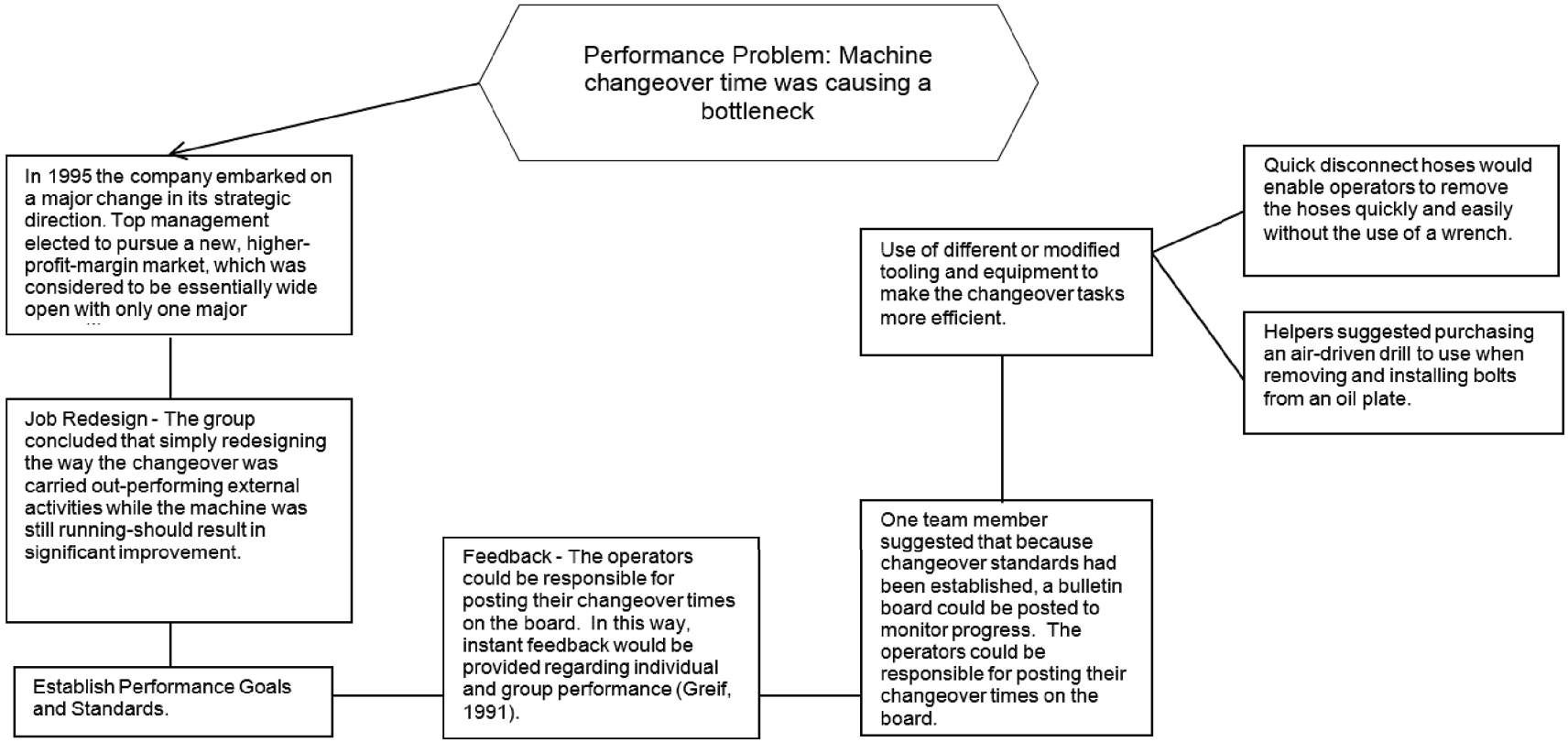


Figure 18: Case 3 in Model Form

From “Improving Roll Changeover Performance in a Manufacturing Organization: Peabody Processing Incorporated,” by Stephen B. King. In J.J. Phillips, W. J. Rothwell, & D. D. Dubois (Eds.), 1998, *Improving performance in organizations* (pp. 111-126). Alexandria, VA: ASTD.

Transformation schemata

The transformation schemata are readily accessible concepts stored in the consultant's memory that informs them that some interventions have a greater impact or trickledown effect than others (See Figure 19). Some interventions carry more weight in an intervention set because they fall under a more predominant performance factor such as organizational systems. Gilmore (2009) referred to this more powerful intervention as the primary intervention. For the purposes of studying intervention set selection they will be referred to as higher, medium, and low transformational power interventions because an intervention set can come in a variety of sequences with sub intervention sets within a larger intervention.

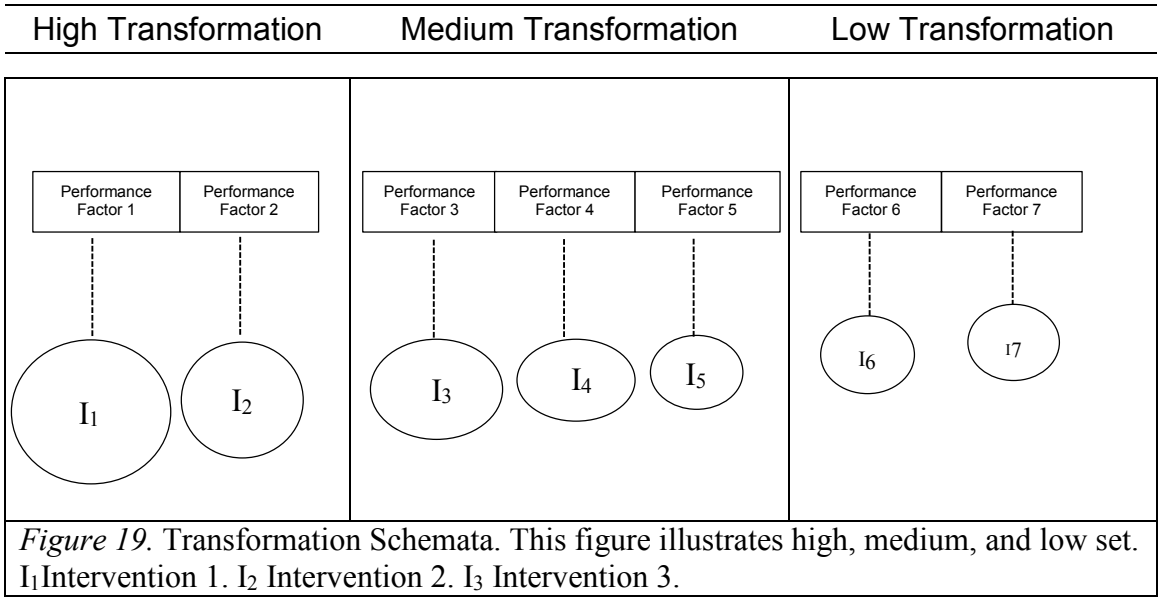


Figure 19. Transformation Schemata. This figure illustrates high, medium, and low set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3.

Figure 19: Transformation Schemata

The high, medium, and low transformation schemata simply give the consultant the ability to quickly see the transformative impact an intervention will have on others in a set. For example, in case #7 by Rekomd (1998), the interventions that were identified were:

1. New software certification process
2. Instructor role design
3. Instructor class schedule (workload)
4. Project head action
5. Instructor evaluation Feedback
6. Recognition
7. Positive comments during weekly staff meetings
8. Certification test
9. Outlook scheduling program
10. Evaluation form
11. Bulletin board
12. Instructor job description
13. Posting Instructor Evaluation score
14. Positive class comments
15. List certified participants names

Using the transformation schemata, a consultant can quickly identify that the "new software certification process" intervention will have a high transformation impact on other interventions in the set and play a big role in reducing the performance gap. While as a part of the intervention set the "list of certified participant names" intervention has minimum impact on reducing the performance gap. See Figure 20.

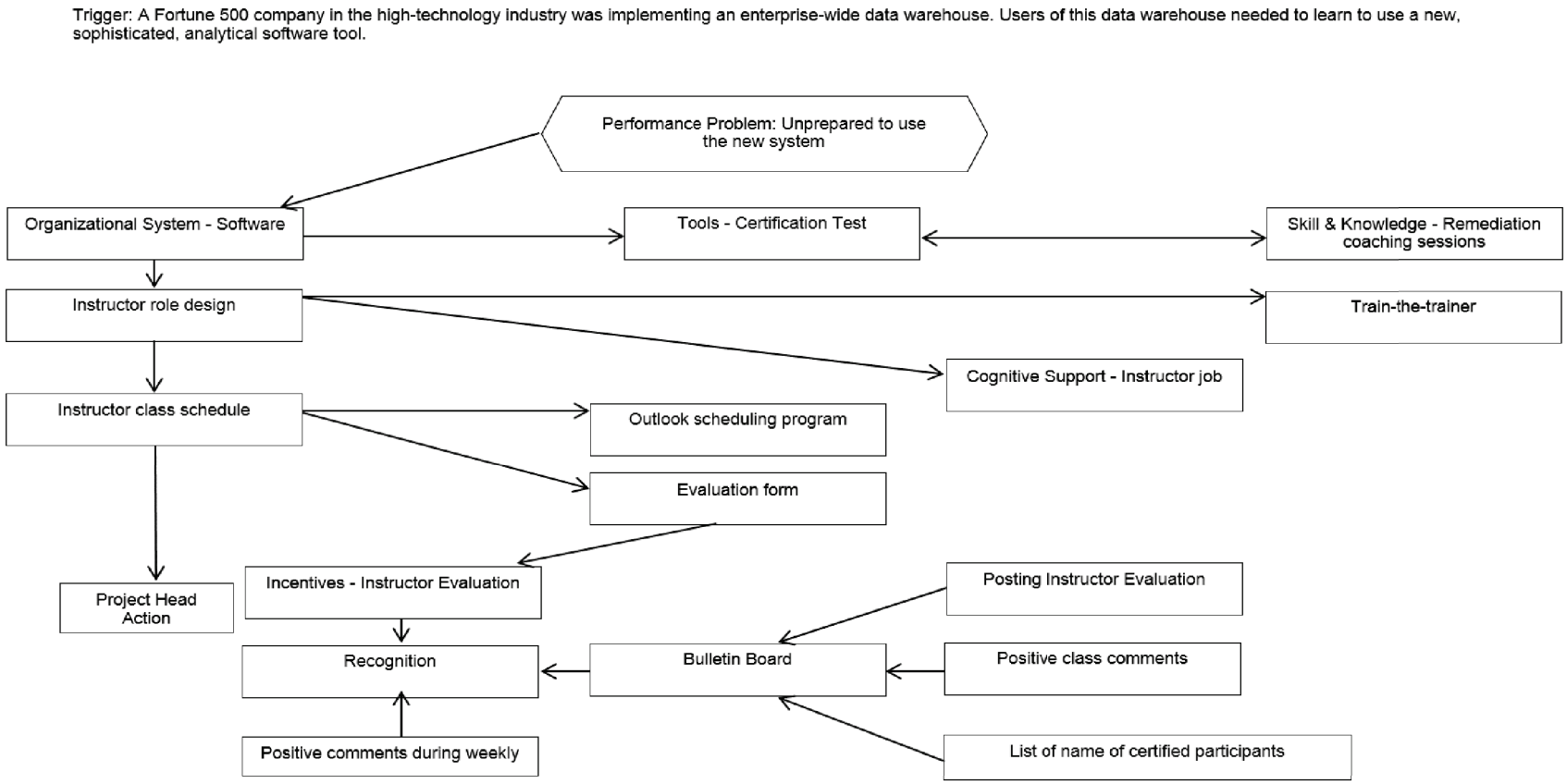


Figure 20: Case 7 in Model Form

From “Improving Instructor Performance Western Digital,” by Petti Van Rekomd. In B. M. Sugrue, & J. Fuller, 1998, Performance interventions: Selecting, implementing, and evaluating the results (pp. 207-218). Alexandria, VA: American Society for Training & Development.

Reverberation schemata

Reverberation schemata are a way for consultants to quickly think about the impact the intervention set implementation will have on the organization. Diagramming the connections between interventions as noted in the mechanism of action schemata helps to identify the impact more easily. An intervention set's impact can be narrow in scope and impact a particular part of the organization. See Figure 21.

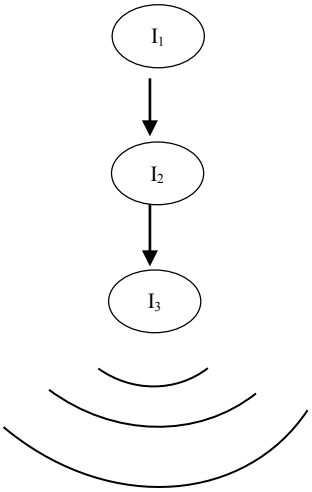
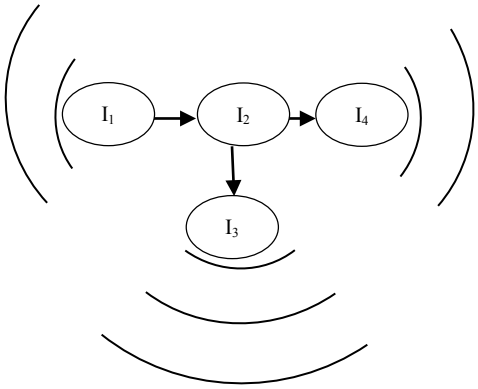
Narrow Reverberation	Wide Reverberation
	

Figure 21. Reverberation Schemata. This figure illustrates a narrow and a wide reverberation set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3.

Figure 21: Reverberation Schemata

For example, in case #10 by Kunneman & Slezzer (2000), the interventions that were identified were:

1. As part of ISO-9000 continuous improvement, redesigned the standard operating procedures for the chemical department.
2. Establish a formal orientation program for current and new operators.
3. Train current operators on the procedures

In case #10, the impact of the intervention set is confined to one department's operating procedures to comply with ISO-9000 industry standards. Wide reverberation schemata refer to larger intervention sets that are broader in scope and influence multiple functions in the organization. For example, in case #24 by Ravishankar and Russ-Eft (1995), the interventions that were identified:

1. A new mission
2. Core values statement
3. Development of a quality plan
4. Establishment of a quality council
5. Target managers received individual feedback or 360-feedback reports.
6. Implement a large-scale training effort at all levels of the organization
7. Instructors attended a four day certification seminar that covered facilitation skills, the behavior modeling process, basic program content, and implementation strategies. See Figure 22.

Trigger: In response to the positive pressure of quality and the negative pressure of foreign competition, organizations such as Western Energy Corporation (WestCo) decided that they had to do business differently.

Unit of Analysis: The initial target population for the quality needs assessment at AER included 10 middle managers and supervisors. Buy-in from middle management was essential for the success of the quality initiative.

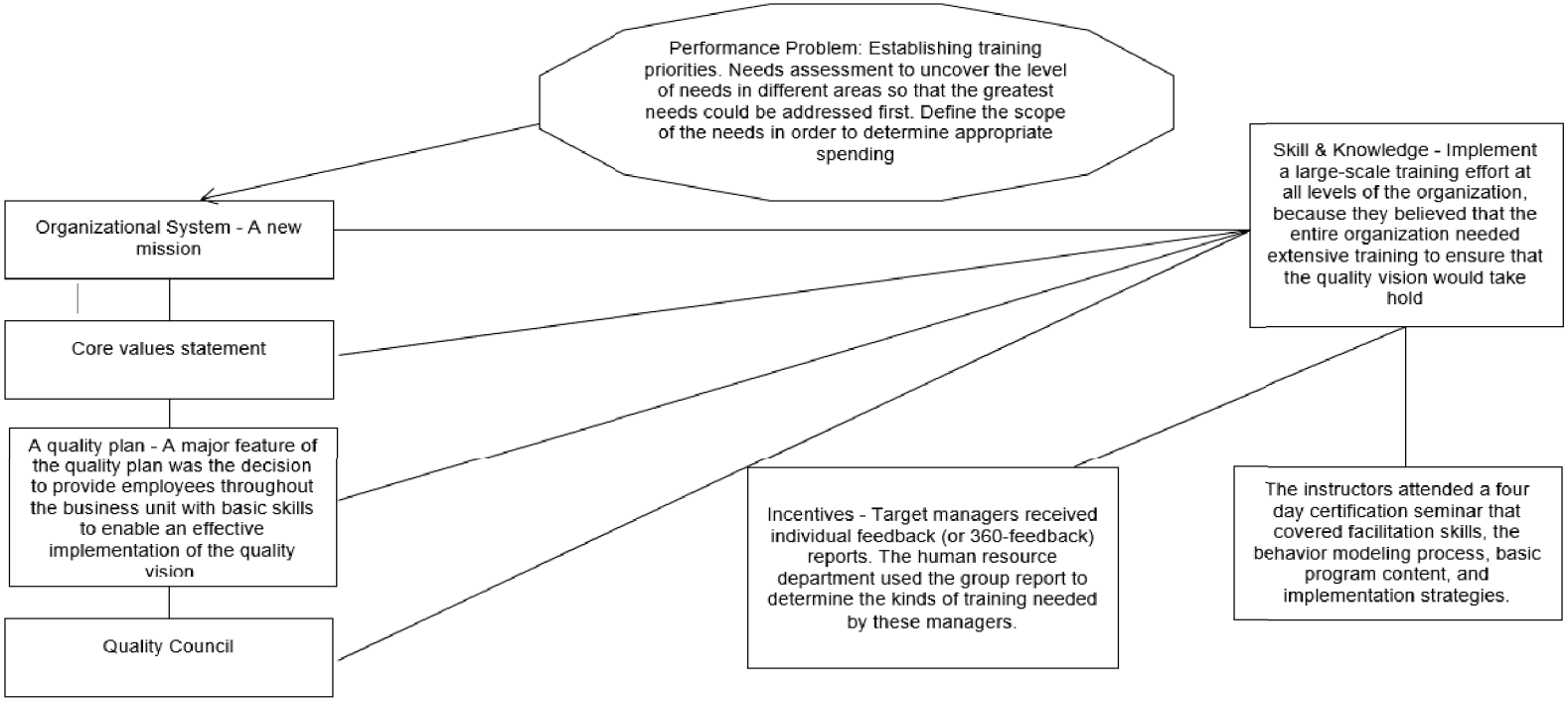


Figure 22: Case 24 in Model Form

From, Quality skills needs assessment by L. P. Ravishankar, & D. F. Russ-Eft. In J. J. Phillips & E. F. Holton III (Eds.), 1995, *Conducting needs assessment* (pp. 207- 226). Alexandria, VA: American Society for Training & Development.

In case #24, the company's decision to focus its direction on a quality environment impacted a wide array of functions in the organization. While this case only addressed a fixed number of interventions for its set, it obvious that other projects and intervention sets will need to be established to continue quality vision and mission in the company.

The six schemata presented are the result of the across case analysis and constant comparative analysis conducted in the study. The cases were analyzed until no new schematic patterns emerged in the data, thus fulfilling grounded theory's theoretical saturation criteria. These schemata reflect the structural thought process consultants take when thinking through how to select an intervention set. They also adhere to the five properties of schemata as suggested by Thorndyke and Yekovich (1979) which are as followed:

1. Be a "prototypical abstract" of the concept of intervention set selection.
2. Be a "organized into a generalization hierarchy in memory."
3. Be in the form of "variables, or slots, that can be filled whenever the schema is used to organize incoming information."
4. Be able to "permit reasoning from incomplete information. This reasoning takes the form of expectations about information we expect to obtain to fill slots in the currently active schema".
5. Be the result of across case analysis, induction or the process of schema refinement over numerous experiences with "…exemplars of the generic concept" (pp. 8-11).

These schemata build off each other to illustrate the elements of intervention set selection and illustrate mental structures used to select intervention sets. As noted in the performance literature interventions simply "flow smoothly from detailed performance and cause analyses" (Van Tiem, Mosely & Dessinger, 2004, p.64). These schemata help to shed light on what that flow looks like. A performance consultant activates schemata stored in memory that allows them to quickly retrieve knowledge about past experiences when there are missing data or if an analysis is not robust and is done before their involvement in the project. This is one of the reasons skilled consultants can sense that a single intervention is most often not the only intervention needed in most instances. In instances where performance analysis is lacking, the consultant fills in gaps or slots in the analysis with knowledge from previous experiences then seeks to confirm their hypothesis without having to conduct another formal analysis. If a novice only relies on the one-to-one match of performance to intervention based on the results of an analysis, they would be missing the power of an intervention set. This approach to intervention selection is often a result of simply relaying on models and heuristics to inform the selection of interventions without consideration of the art, science, and intuition aspect of the intervention set selection process. Knowing how to use performance models and heuristics is a prerequisite to understanding what is necessary for the initial problem and intervention identification. However, these models and heuristics become limiting when focusing on the intervention set selection process. That is why the schemata and principles presented in this

study become more valuable in instances of new performance problems for more skilled practitioners.

Finding 4: Principles Guide Intervention Set Selection

As noted, memos were written throughout the entire research process. These memos were used to develop the schemata in diagram form as well the intervention set selection principles. Similar to the previously mentioned principles, the following principles relied on multiple iterations of the coding within and across the cases. Transitioning between concepts, memos, and principles required patience and an understanding of how the process of intervention set selection takes place in the work environment. Annotations and a review of the literature were used to solidify identified principles and demonstrate the connections to the performance improvement knowledge base. Permeating principles began in draft form, were refined throughout the iterative data collection process and analysis, and finalized after the intervention set schemata were developed.

Permeating Principle 1b

Consider the consequence of each intervention and reflect on the intervention set. Consultants should always consider the consequences of each intervention selected as a part of an intervention set. In doing so, the consultant should look at all the interventions in the set as a whole to identify how they work together and what keeps them functioning cohesively. A consultant may not know all the consequences of the set with certainty, but a good faith effort should be taken to gain knowledge about potential risks.

Consultants should always consider the consequences of each intervention they select as a part of an intervention set. In doing so, the consultant should look at all the interventions in the set as a whole to identify how they work together and what keeps them functioning cohesively. This principle is based on Gilbert's (1978/2007) idea of diffusion of effect where no single intervention should have a maximizing effect but its function should generate power for the other interventions in the set (Chyunh, 2005). No one single intervention should carry so much weight that it could stand by itself without other supporting interventions that work in a combined set to reduce the performance gap. For example, in the case by Johann and Patterson (1998) titled "Organization Effectiveness and Training Partnering to Improve Business Results," the individual interventions were as followed:

1. Approval process redesign
2. Email embedded system
3. Training
    a. Accomplishment-based training approach for employees
    b. One-day workshop for system administrators
4. Notification – embedded certification procedure
5. Notification to the administrators that training is complete

Any one of the individual interventions in this case working in isolation would not have the desired effect on the organization as they do as a combined set. See Figure 23 for the intervention set model of the Johann and Patterson (1998)

case. To realize the significance of the set, the modeling technique presented earlier should be used during the execution of this principle.

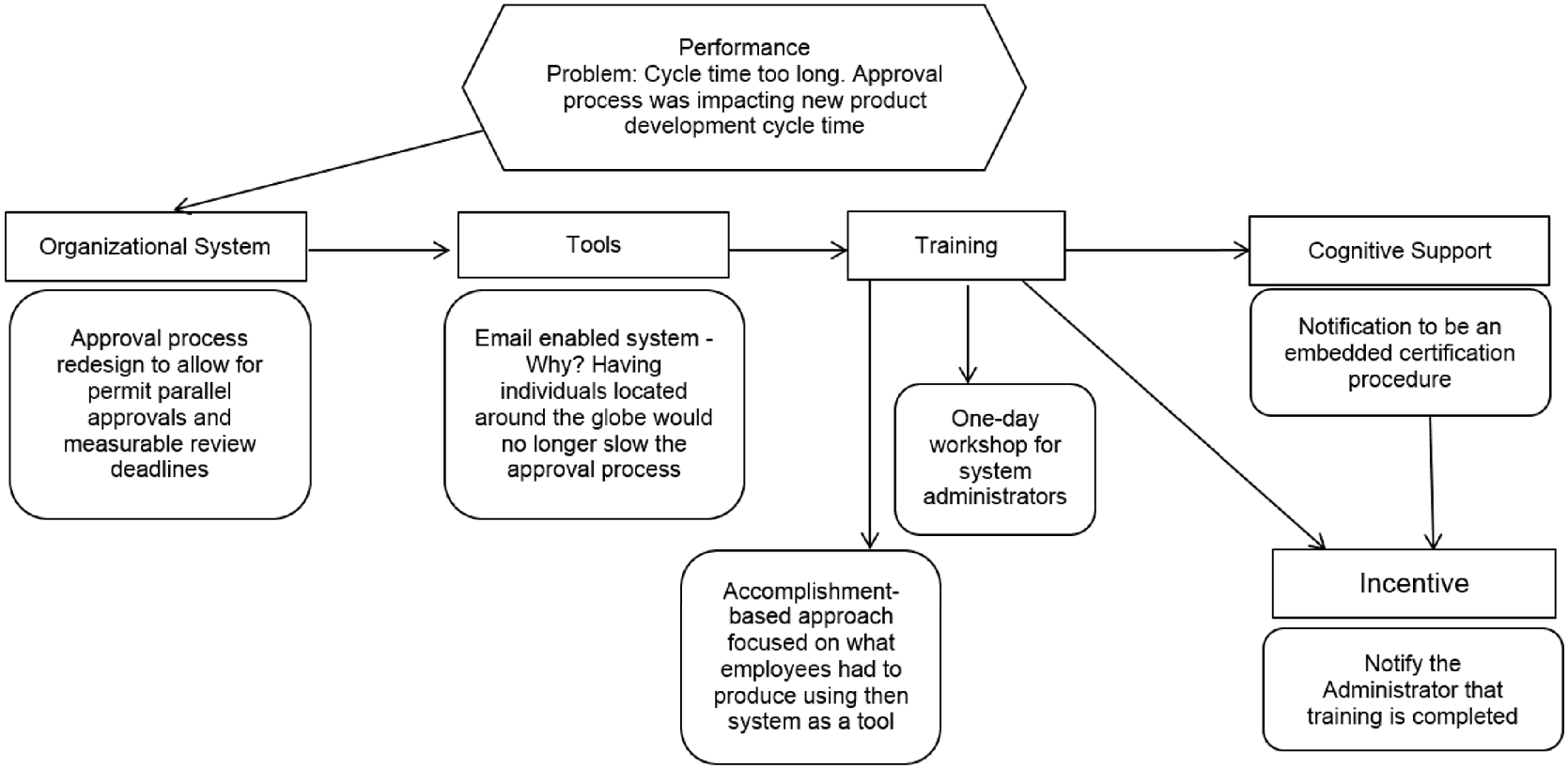


Figure 23: Case 14 in Model Form

From “Organization effectiveness and training partnering to improve business results,” by Johann, B., & Patterson, P. A. In T. J. Esque & P. A. Patterson (Eds.), 1998, *Getting results: Case studies in performance improvement* (Vol. 1, pp. 129-137). Amherst, MA: HRD Press.

Permeating Principle 1c

Understand the impact of the set. It is the responsibility of the performance consultant to inform the client of the intentional or unintentional impact the selected intervention set may have on other parts of the organization and surrounding community. This allows the client to prepare and keeps the client consultant relationship healthy.

Occasionally stepping back and focusing on the intervention set as a system that will be implemented into a larger organization system is important. Without doing so, the consultant is not able to install safeguards for a healthy implementation of the set. Knowing the impact the set will have on the organization also allows the consultant to prepare the client for what to expect as a result of the implementation. Keeping the client aware of the possible impact to other parts of the organization or the industry as whole is essential to a healthy partnership.

For example, in the case by Davis and Cerqueira (1999) titled “Assessing the results of training: The case of water sanitation in Brazil,” the problem revolved around the ineffective testing of water quality. See Figure 24. While the intervention set was based on the premise of the organization’s implementation of strategy-based assessment techniques to measure learning outcomes by examining the impact of the set in the case, the consultant could see that this intervention set had multiple layers of strategy. The intervention set was not simply confined to training individuals to test the water quality properly but it also affected organizational strategy and incentives.

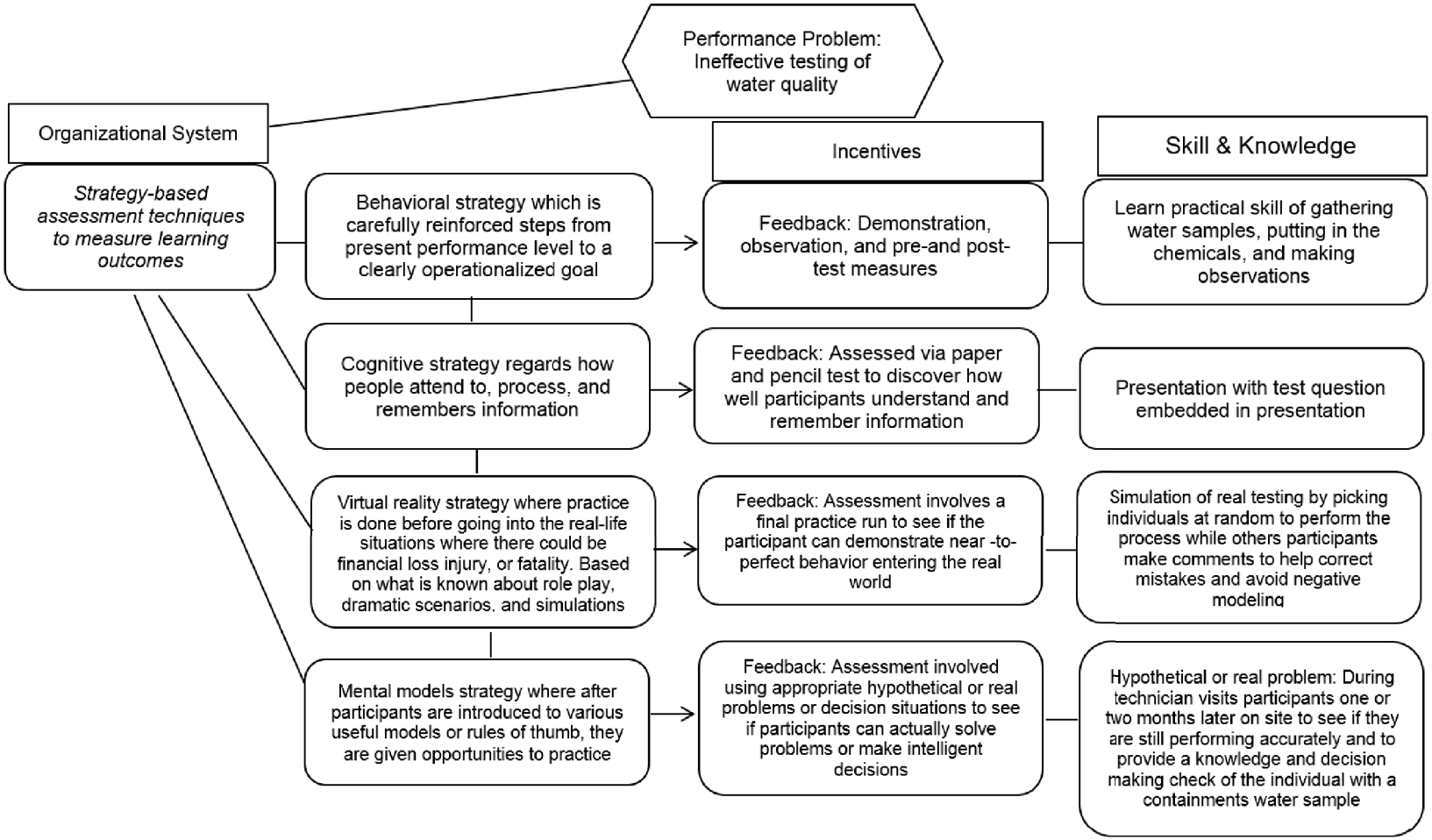


Figure 24: Case 6 in Model Form

From “Assessing the results of training: The case of water sanitation in Brazil,” by Davis, J. R., & Cerqueira, D. A. In T. K. Hodges (Ed.), 1999, In *Measuring learning and performance* (pp. 107-114). Alexandria, VA: American Society for Training & Development.

Permeating Principle 2

Select an evidence based intervention set. A consultant must move beyond only gathering evidence during the needs analysis phase and gather evidence on individual interventions and sets of interventions. This evidence should be sought through a deep understanding of performance improvement published research and theory as well as through evidence acquired during practical experience and observation in the field.

An evidence-based approach to performance improvement is a hallmark of the field; however, experts in the field have criticized practitioners for the lack of theoretical and research implementation when it comes to suggesting solutions to performance problem (Stolovitch, 2000; Clark and Estes, 2000). Due to some expert consultants many years of experience in an area, their concept of theory can often simply be based on that experience rather than any validation by an outside entity. In the performance improvement literature, theory and research are defined as a practitioner inquiring about a performance problem and theorizing the possible problems based on the data collected (Brethower, 2000). This approach to theory and research is limiting and possibly damaging to the organization receiving the proposed interventions. A performance consultant should have a deep understanding of how to use research and theory to complete a comprehensive analysis, but also how to use those same skills when selecting an intervention set and taking the process one step further by citing evidence or theory supporting their selected intervention set. By having a vast and deep understanding of performance research and theory, a consultant is better equipped to serve the client and select an intervention set that is based on evidence. In the case titled, “Coaching Sales Performance,” an organization

struggled with “lower productivity and higher attrition from new sales associates than they judged to be acceptable” (Strayer and Rossett, 1994, p. 39). The consultant’s decision to use coaching as a foundation for the intervention set was not by chance. To the untrained eye it may seem that a consultant’s years of experience enables individuals to automatically select coaching to reduce the performance gap. However, as noted in the literature on schemata, automatic recall of knowledge is often based on stored knowledge of a similar situation the consultant has encountered in the past, and in turn, the consultant expands their schemata to fit the current situation. The consultant could be confident that coaching was a reliable selection option for the intervention set because they were able to see the connection between the performance problem and the entire intervention set. Strayer and Rossett cite several research sources that explain why coaching would help reduce the performance gap in this particular case. Excerpts from Strayer and Rossett, (1994) explain what coaching is and the impact coaching has on performance. For example, “On-the-job coaching for improved work performance gained credibility as one way for American businesses to recapture their competitive edge (Tack, 1986)” (p. 44). Additional references from the case state:

> Most authors support the contention that the main task of a coach is the development of people. Clawson (1985, p 38) states that “a coach’s primary responsibility involves the development of task-related skills.” Robertson (1991, p. 54), in a real estate journal, states that “the focus of field coaching is skill training,” emphasizing the need to demonstrate skills, as well as to observe, offer feedback, and ask questions that will lead the neophyte to improve performance.
>
> Coaching, however, is more than the transmission of skills and task-related abilities. Murry and Owen (1991) expands the relationship to encompass career development, a function associated more closely with

> mentoring than coaching. Responsibilities include sponsoring developmental opportunities, providing organizational insights, giving feed-back on observed performances, and planning career paths. A mentor also serves as confident in times of personal crises.
>
> Farren, Gray, and Kaye (1984) expand the expectations associated with coaching by elaborating on the associated roles of sponsor, supporter, teacher and devil's advocate. (p. 44)

These sources explain how coaching impacts particular problems and proved invaluable in identifying coaching as a part of the intervention set. Evidence-based intervention set principles can be determined through the first-hand experience of consultants or through established and well-researched theory.

The third permeating principle is divided into two parts because there are elements of principles demanding specific attention and guidance for performance consultants. 3a focuses on the balancing act between art, science, and intuition that performance consultants must constantly maintain in the intervention set selection process. While permeating principle 3b guards against using template or cookie cutter approaches to intervention set selection.

Permeating Principle 3a

Balance art, science, and intuition. A consultant's intuition and artistic expression should not be ignored in the quest for scientific reasoning nor should it be the sole basis for the selection of an intervention set. Intuition and artistic expression need to be done in tandem within a scientific process and grounded in evidence-based practices.

Consultants should consistently keep in mind that there are elements of art, science, and intuition to the process of intervention set selection. Dessinger, Moseley, and Van Tiem (2012), state "…it is up to the practitioner to select or design the most appropriate intervention based on his or her knowledge of

performance improvement theory and best practice, as well as familiarity with the specific organization" (p. 13). Selecting an intervention set based on scientific reasoning is specifically highlighted in another principle of this study: Select an evidence-based intervention set. However, a consultant's intuition and artistic expression should not be ignored in the quest for scientific reasoning nor should it be the sole basis for the selection of an intervention set. Intuition and artistic expression needs to be done in tandem with a scientific process and evidence-based rationale.

Permeating Principle 3b

Avoid the cookie cutter approach. A cookie cutter approach refers to a consultant promoting an intervention set that they are familiar with or prefer due to their expertise, instead of selecting an intervention set that uniquely addresses the performance problems of the client. Consultants should look at each intervention in the set as having a unique power to assist in reducing the performance gap.

A cookie cutter approach is a figurative phrase meaning to think myopically, or to stay within the box, using a one size fits all or a standard intervention to address all performance problems. Although a cookie cutter approach may make it easy for the consultant to implement, it goes against the reality of addressing performance problems in dynamic organizations. While expertise is important, a consultant should not make the mistake of solely using the interventions in which they have the most experience. As noted in the literature review, training as an intervention is a commonly selected in performance improvement initiatives. At times training is the only intervention selected when a novice or an individual with no performance improvement

knowledge or experience is managing the initiative. Training is not the only go-to intervention; consultants should be wary of overly implementing any familiar or signature intervention. For example, if a consultant is an expert in implementing incentive programs, they might be tempted to often offer an incentive program as an intervention to their clients. In some cases, a consultant may be sought out by a client based on their expertise in a particular intervention. As a result the client may expect that intervention to be chosen in the final intervention set. Despite client expectations, however, the essence of an intervention set should not allow for a cookie-cutter intervention set but instead the consultant should tailor the intervention set based on the performance problem. By using the enforcement schema, a consultant is able to quickly expand their thinking about what other interventions could reinforce other more foundational interventions in the set to enable equilibrium. The consultant should always think about the multiple forces working in an intervention set situation. Since every situation will consist of multiple diverse forces arranged in any number of different ways, a consultant should not take a cookie-cutter approach to intervention set selection. A quick glance at all the study's case models demonstrates that consultants and their work are most effective when they take a "non-cookie cutter" approach to implanting an intervention set.

Permeating Principle 4

Intervention Set Modelling (ISM). ISM is a prerequisite to prototyping and iteration because it serves a practical method to enable strategic thinking. It allows for a simple modeling technique and should be used as a way to identify

connections and gaps among and between the interventions in the set from a macro level.

The 4th principle, intervention set modeling a prerequisite to prototyping and iteration, builds on Wedman and Tessmer's (1990) work on expert designers creating iterations of rapid prototyping as deliverables. It also builds on Spitzer (1999) who states, "High-impact interventions should be designed with an iterative approach" (p. 180). However, these authors do not offer any recommendations for strategically thinking about the rapid prototyping and iterative process before it is executed. In addition to creating rapid prototypes of individual interventions, consultants should use the intervention set modelling (ISM) technique to make rapid visual prototypes of the intervention sets, which in turn will stimulate the consultant's mechanism of action schemata making it easier to put the intervention set into practice at the prototyping stage. ISM is a simple modeling technique and should be used as a way to see connections and gaps among and between the interventions in the set from a macro level. The diagramming technique quickly communicates the interventions set to partners, collaborators, and the client for buy-in, resources, and additional time if needed. This method was inspired by the Socratic (469 – 399 BC) approach to teaching whereby mapping is used to understand a concept, its use, and its relationship to other items in the environment. This study presents the Intervention Set Modeling (ISM) technique as a prerequisite to rapid prototyping and iteration. The intervention set modeling technique was used throughout this study as a method to visually represent patterns among and between all the cases. Zigon's (1994)

case, Performance Management Training Yellow Freight System, is provided in model form as an example of the technique. See Figure 25.

When a consultant retrieves the mechanism of action schema, they are relying on past experience and research to justify the necessity of a particular intervention. However, there is also a creative element involved in the selection process. A consultant may look at the intervention set and see, based on experience, that there is an imbalance in the set. Intervention set modeling is also a useful tool for a consultant because it provides a visual representation of the set and enables them and others to reflect on the gaps in their intuitive reasoning. Consultants' experiences allows them to trust their intuition more than a novice might if placed in the same situation lacking analysis. For example, in the case by Navran and Forbes (1995) titled, "Pride in Public Service Oregon Department of Transportation," the consultant used a combination of art and intuition to handle the following situation presented in the case:

> It was the last two findings, the double standard and the vote of no confidence that got the management team's attention. Denial and anger were full-blown and clearly expressed, along with a fair share of rationalizing and self-justifying during Day 1 of the meeting. The attitude was captured in the not-quite-facetious remark that the project had "obviously randomly sampled the wrong 600 people. We need to go back and randomly survey a different 600 employees who have better attitudes". (p. 181-182)

Consultants frequently encounter the human tendency to deny evidence that is not appealing. In this case, the consultants were able to justify their findings and their proposed interventions by doing the following:

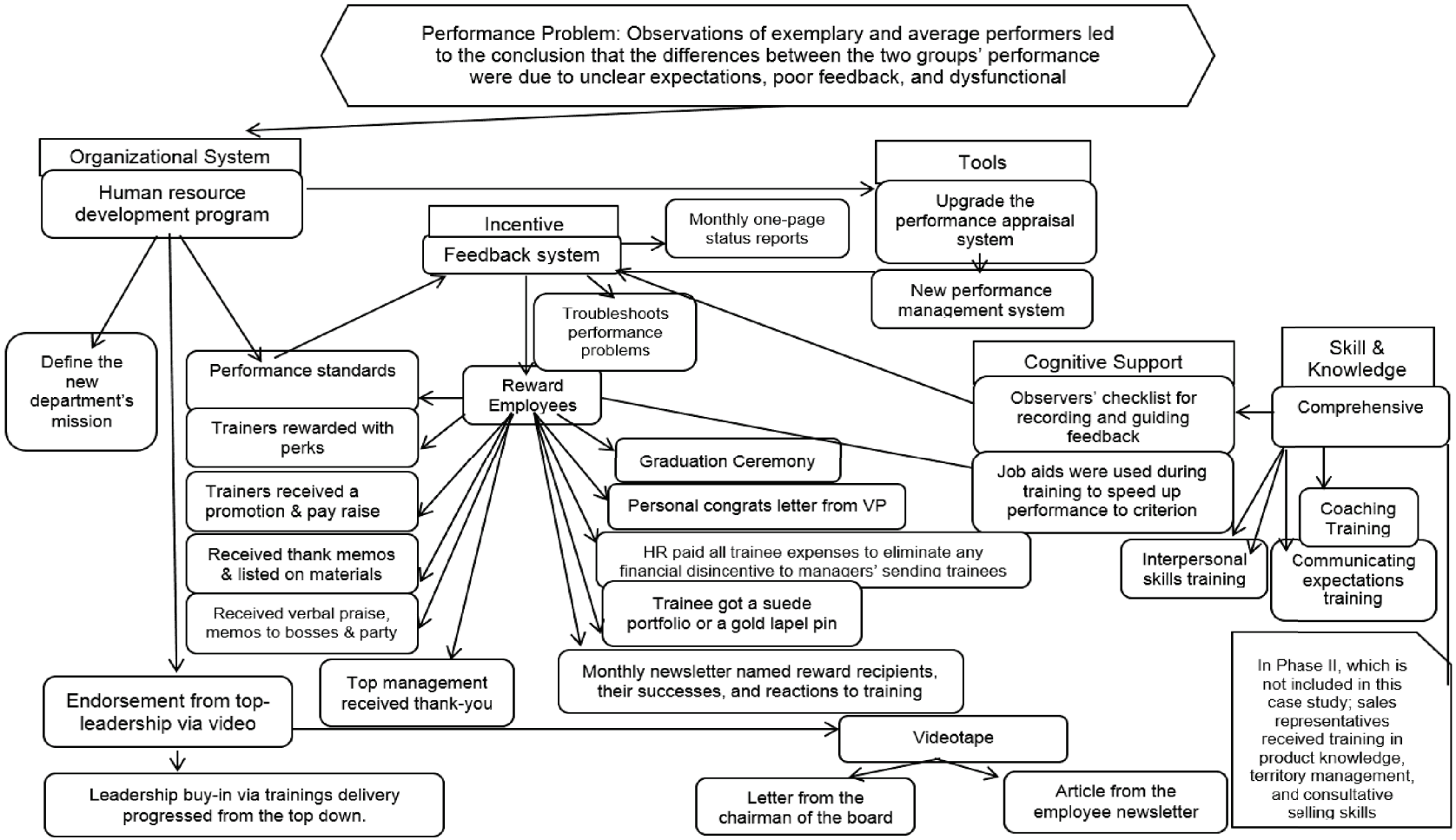


Figure 25: Case 2 in Model Form

From "Performance management training: Yellow freight system," by Zigon, J. In J. J. Phillips (Ed.), 1999, In *Measuring return on investment* (Vol. 1, pp. 253-269). Alexandria, VA: American Society for Training & Development.

> Our best hope for working through the senior managers' resistance was to make the data more real to them. We had to break through their desire to deny. They had to be willing to accept that what we were saying was both real and important. The best available tool was that the survey itself was laced with open-ended questions. Employees had a chance to speak to the group on the importance of the issues in their own words, not just through the sterile graphs. Our task was to get the group to read the nearly 50 pages of single-spaced text that captured the emotions, pain, anger, and frustration of the employees. (p. 182)

Performance improvement authors suggest that it is the interpretation of data that allows the consultant to connect the dots between multiple interventions to address performance problems; this is the art or craft elements of the profession (Dessinger, Moseley, and Van Tiem, 2012; Robinson and Robinson, 2006). This study argues that the artistic element of performance improvement can go beyond the analysis phase and is a part of the intervention set selection phase as well. The idea that an intervention set is aesthetically pleasing or has some artistic elements means that the consultant adheres to the principles outlined in this study governing intervention set selection. It also means that the intervention set becomes well ingrained into the organization and evolves into a standard operating procedure.

Permeating Principle 5

Be open to continuous feedback. A consultant should always listen to all feedback about an intervention set. This allows the consultant to use others as sounding boards for what will and what will not work. Too often consultants only attempt to gain buy-in at the beginning of a project and assume the buy-in will be sustained throughout the performance improvement process. The consultant must think about when they are no longer a part of the initiative, so they should listen and be aware of critics and take notes regarding potential flaws.

A continuous feedback loop can take a variety of forms. For example, in the case by Van Rekom (1999) titled “Improving Instructor Performance Western Digital,” each of the Kirkpatrick’s four levels of evaluation were built into the continuous feedback of the performance improvement initiative. Level 1 includes surveys and instructor evaluations. Level 2 involves a performance test that the instructor must pass. Level 3 asserts that transfer learning is reflected “…by how well the instructors demonstrated their learning and by how the participants performed at the end of the classes led by the instructors…” (p. 214) through instructor evaluation forms of participant performance and a “…certification test based on the class content…” (p. 215). Level 4 was determined through a return on investment analysis of the gains in productivity each day.

In the case by Plant and Douglas (2003) titled “Strategic Performance Measurement the Case of Mississauga Transit,” the consultants built a team into the intervention set as a mechanism for continuous feedback. The excerpt below explains how and why the team was established.

> Once the goals and measures were established, continuous improvement teams were created. Representation for these teams consisted of selected mechanics and numbers of management. Each shift had its own continuous improvement meeting. This was important for capturing the issues indigenous to each shift. (p. 25)

In other cases such St. Clair and Sharp (1998) and Jimenez (2002), the consultants built in data analysis mechanisms so that the client could continuously monitor key performance indicators long after the consultant was gone. The hallmark of a successful performance improvement initiative is that it

is self-sustaining and allows the client to make appropriate adjustments as needed without total dependence on a consultant.

Finding 5: Intervention Set Selection Substantive Theory

The founders of the grounded theory method, Glaser and Strauss (1965), note that the initial theory generated should be a substantive theory which is "the basis upon which grounded formal theory is generated" (Glaser & Strauss, p. 5). Glaser and Strauss (1965) state that "By the discovery of substantive theory we mean the formulation of concepts and their interrelation into a set of hypotheses for a given substantive area-such as patient care, gang behavior, or education---based on research in the area" (p. 5). The value of grounded theory rests in its ability to generate theoretical conceptualization through the generation of patterns in the intervention selection process exhibited in the cases by performance consultants.

The substantive area in this study is interventions set selection. The schemata presented are a representation of performance consultants "organized experiences" and is a "bounded, distinct, and unitary representation" of the selection process (Mandler, 1984, p. 55). The associated principles aid the consultant in the process of selecting the intervention sets and are the results of concepts refined through memoing. Drafting of the substantive theory used both the schemata and the principles that were developed.

Intervention Set Selection Substantive Theory

The aim of this grounded theory study was to develop intervention set selection schemata and principles. As a result of the grounded theory method used a substantive theory of intervention set selection was generated based on data. See Figure 26.

Intervention set selection became the central organizing category after numerous iterations of coding, memoing, and constant comparison. The substantive theory presented is focused on intervention set selection in which there are three distinct components:

1. Comprehending the situation as it relates to the client, the analysis, the problem, and the literature
2. Activating schemata to synthesize an intervention set
3. Adhering to principles

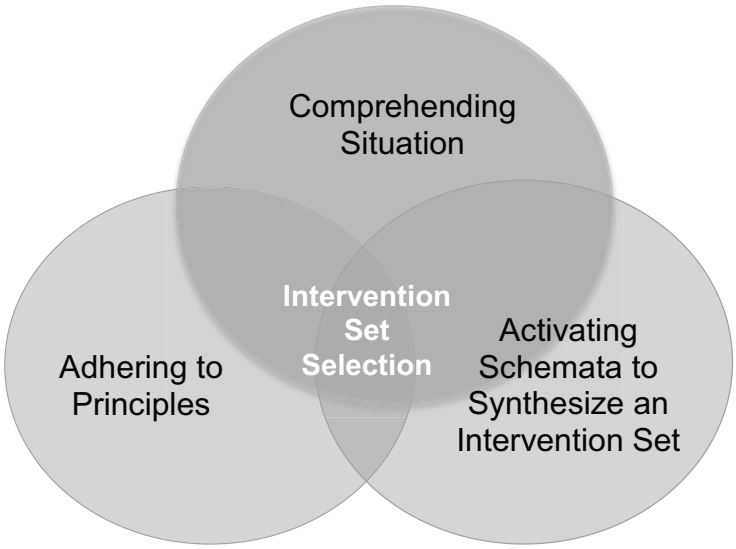


Figure 26: Intervention Set Selection Substantive Theory

Figure 26. Intervention Set Selection Substantive Theory. This figure illustrates how three components of selection work as one to generate intervention set selection.

Component 1: Comprehension of the Situation

There is no denying the significance of continuously analyzing the situation and context in which the performance problem rests. The need for a consultant to understand their client, analysis, problem, and literature is seen as the first step towards the selection of an intervention. The notion of understanding the situation is briefly mentioned in the literature by Dean Spitzer (Stolovitch & Keeps, 1992). Comprehending the situation is traditionally viewed within the analysis domain of the performance improvement discipline; however, as Allison Rossett notes analysis should be emphasized as much or more in the intervention planning and execution stage (Stolovitch & Keeps, 1992). The consultant is always thinking of the client, results of the analysis, problem, and where it all fits into the literature. It is in this component that the consultant is setting the stage for the activation of schemata to synthesize the intervention set. Behaviors demonstrating component 1 include:

- determining how the client self-diagnosed problem
- determining what home remedies client implemented
- conducting an analysis
- analyzing the performance data
- recalling performance improvement literature and research to place situation into context
- identify what other interventions could be connected to the interventions that emerged as a result of the analysis

Component 2: Activating Schemata to Synthesize an Intervention Set

After comprehending the situation the consultant activates schemata. Schemata can be activated at any time during the intervention selection process. The schemata "activation processes occur automatically and without awareness on the part of the perceiver-comprehended" (Mandler, 1984, p. 56). The data that are generated about the client, analysis, problem, and the literature are used to fuel the processing mechanism that activates the schemata. Comprehending the situation helps the consultant to make deliberate choices about what to do with the incoming data. Schemata are not static but constantly changing and as new data comes into view throughout the performance improvement process schemata evolve. Mandler (1984) notes:

> Schemas operate interactively, that is, input from the environment is coded selectively in keeping with the schema currently operating while that input also selects relevant schema. Whenever some event in the environment produces "data" for the schematic analysis, the activation process proceeds automatically (and interactively) to the highest (most abstract) relevant schema. Evidence from the environment activates potential schemas, and active schemas produce an increased readiness for certain evidence and decreased readiness (inhibition) for other evidence. (p. 56)

This component in the theory of intervention set selection is known as activating schemata to synthesize an intervention set and is where the constant iteration of design and development takes place. It is also where diagramming and rapid prototyping takes places to illustrate the intervention sets and connections to sub-sets. As the consultant expands in experiencing performance improvement problems, repertoire of schemata to retrieve will grow through what Mandler (1984) refers to as accommodation and assimilation. Schemata accommodation

and assimilation allows the consultant to address more complex performance problems because of capacity to retrieve more complex schemata embedded in abstract schema are now more available in stored memory (Mandler, 1984, p. 62-63). The schemata that support substantive theory of intervention set selection are provided below.

The first schemata that are activated are referred to as the *composition schemata*. Composition schemata aid the consultant in making a simple yet critical decision in the intervention set selection process, that is, select a single intervention or a set of interventions. As noted, it is rare to have a single intervention as the only intervention needed to address a performance problem; however, it is the initial mistake novice or unskilled consultants make when in the intervention selection phase of the performance improvement process. *Directional schemata* guide the consultant as they explore the depth and breadth needed for each linkage in the intervention set. The dimensional set schema help the consultant examine an intervention set's depth under a particular performance factor. While the linear set schema guides the consultant cross the span of all performance factors. The consultant must be mindful of possible gaps in the results of an analysis. The *mechanism of action schemata* helps the consultant to see what additional interventions need to be activated in order for interventions that were identified via the analysis to be properly implemented. The intervention that serves as the mechanism of action can be located anywhere in a set and active another intervention vertically, horizontally, or a combination of both. The *enforcement schemata* helps the consultant decide if

an intervention needs to be reinforced by another intervention. These schemata are important because they provide the consultant with checkpoint opportunities to see if identified interventions are stable enough on their own or require enforcement. When selecting an intervention set a consultant must consider the consequences or impact of each intervention selected within the set. The *transformation schemata* enables the consultant to consider the impact or transformation power each intervention has on one another or on the set as a whole. *Reverberation schemata* provide the consultant with a quick way to think about how the intervention set as a whole will impact the organization. These schemata are critical to the intervention set selection process because an intervention set can intentionally or unintentionally cause a distribution in other parts of the organization.

Component 3: Adhere to Principles

The principles that emerged from the data are the foundational behavior associated with the process of intervention set selection. Adherences to these principles were not only visible throughout the cases but also complement the schemata developed. The schemata in this study provide a way for consultants to think about intervention set selection, while the principles provide a way to for the schemata to evolve throughout the selection process. See *APPENDIX C. Intervention Set Selection Job Aid* for the Intervention Set Selection Principles.

This study provides a substantive theory for interventions set selection and begins to explain the correlation between a consultant's comprehension of

the performance situation in the context of client, analysis, the problem, and the literature, the activation of schemata, and the adherence of principles. The substantive theory of interventions set selection meets the criteria set forth by Glaser and Strauss (1967) for judging a substantive theory which are: fit, understandability, generalizability, and control.

The substantive theory of intervention set selection meets the criterion of fit because it is a practical and functional idea that can be applied by novice and skilled consultants. The theory is a simplistic three phase theory that can be understood by consultants who are not performance improvement professionals but have an interest in intervention set selection. The theory is generalizable in the sense that it can be applied to a multitude of industries and a wide range of performance improvement situations. The intervention set selection theory provides the consultant with control by relaying on fundamental schemata and principles that will provide them with “structure and process of daily situations as they change through time” (Glaser & Strauss, 1967, p. 237). Future research needs to be focused on formalizing the theory.

V. CONCLUSIONS, IMPLICATIONS, AND REFLECTIONS

The findings presented in this study only scratch the surface of research possibilities on the topic of intervention set selection. This concluding chapter summarizes the key lessons of the study and implications for the field of human performance technology (HPT). The chapter also examines the study's limitations and concludes with reflections on the role of reasoning in intervention set selection including the research pathway intervention set selection creates between the fields of HPT and design as well as similarities between the roles of a performance consultant and a physician. This chapter concludes with a caution against maintaining the status quo of practice, teaching, and research in the area of intervention set selection.

Conclusions

The literature review in Chapter 2 highlighted the significance of the intervention selection process to the field of performance improvement; however, gaps were found in the literature. For instance, scholars have not provided the field with adequate direction on how the process occurs, specifically guidance on how practitioners bridge the intervention selection phase with the analysis phase. The analysis and design literature also did not provide adequate insight as to how to select intervention sets. As a result, what is known about intervention selection is limited. By addressing the research questions and providing lessons learned throughout this investigation, this study demonstrates how the inclusion

of an intervention set selection phase in the performance improvement process can address these knowledge gaps as well as expand the knowledge base of performance improvement. The answers to the study's research questions are summarized below in the form of lessons learned.

Lesson 1 – Practitioners Select Intervention Sets

The question posed in this study focused on building knowledge around how practicing professionals select interventions. There was a two-part answer to this question. First, there was no evidence of only one intervention being selected to address a performance gap, which demonstrated that interventions were selected in the form of a set and not as a singular entity. For example, even if the intervention selected was training, there was another intervention selected that supported the training. Supporting interventions within the set may include goals, policies, procedures, or even job aids. This finding resulted in the creation and defining of the term *intervention set selection* in this study. The establishment of the term intervention set selection and its meaning has significance for both the practice and the research of performance improvement. Incorporating a more accurate term such as intervention set selection may seem like a subtle contribution to the discipline, but it does have an influence on the behavior of practitioners and researchers. Expanding the terminology to include intervention set selection enables scholars to rethink the phenomenon of intervention selection, thus opening the possibility for more targeted studies on sets of interventions. Additionally, which terminology is used and how it is used is

important for communication within and outside of the field. Accuracy in terminology enables practitioners to be more precise about what they deliver and increases the impact they have on organizations.

Practitioners' use of schemata was the second part of the answer to the question of how professionals select interventions. In addition to the art and intuition elements of intervention set selection, a practitioner's use of schemata illustrates that intervention set selection is a skill that can be developed. As an individual is exposed to more performance improvement experiences, their knowledge of schemata expands, and practitioners' ability to act on schemata becomes more of an automatic behavior. Likewise, schemata help scholars to better understand how expert practitioners are able to streamline problem solving and make connections in a situation where analysis is limited.

Lesson 2 – There Are Discernable Patterns

The lesson learned above informed the research question: Are there discernable patterns that performance improvement professionals follow when selecting interventions? Through the iterative coding process, patterns were observed in the data. One emergent pattern was the form of guiding principles practitioners followed when conducting intervention set selection. The second type of observed pattern involved various characteristics of the schemata found. See *APPENDIX C. Intervention Set Selection Job Aid* for a visual representation of intervention set selection schemata. One of the goals of scientific inquiry is to develop predictions and generalizations to explain phenomena. By identifying

these discernable patterns, this study sets the foundation for generalization about intervention set selection and initial prediction studies on intervention sets.

Lesson 3 – There Are Guiding Principles

One of the research questions asked: Are there principles that guide intervention selection? The memo writing process, required in grounded theory method, derived the intervention set selection principles. See *APPENDIX C. Intervention Set Selection Job Aid* for the Intervention Set Selection Principles. These principles serve as guides that define how to select an intervention set, explain "how" and "why" certain actions happen during the intervention set selection phase, and function as a guide for novice and expert practitioners when selecting intervention sets in a variety of unique situations. As much as possible, expert practitioner's experiences with using principles in real-world contexts should be documented in case studies. This will enable students of performance improvement to learn from the experiences of others and inspire future research so the field's knowledge base can be expanded.

Lesson 4 – Intervention Set Schemata Exist

This study's findings demonstrate that there are schematic elements involved in the intervention set selection process. Modelling the cases and being immersed in the iterative coding process provided a powerful visual of each case's intervention set that could not have been observed otherwise. The development of this study's schemata *composition*, *directional dependence*,

mechanism of action, *enforcement*, *transformation*, and *reverberation* adds new knowledge to the field of performance improvement. The identification of these schemata help to explain a practitioner's systematic behaviors when selecting an intervention set. Schemata also help to illustrate the art and the science inherent in intervention set selection.

Depending on how a practitioner uses them, schemata may help or hinder innovation in intervention set selection. Therefore, it is necessary to provide the risks and concerns associated with this study's findings. The first concern, as alluded above, is the possibility that schemata can stifle innovation if used incorrectly. Practitioners should not simply use these schemata as procedural guidelines for how to select an intervention, but instead they should view these schemata as foundational reference points for starting the intervention set selection phase of the performance improvement process. Keeping an open mind, absorbing new research, and embracing different perspectives are essential. In turn, the art and intuition principles are also important to the process and complement the schemata. The principles that evolved in this study help to mitigate the risk of practitioners stifling innovation as a result of using particular schemata. The schemata presented are suggested for novice consultants and students seeking knowledge on how to refine their intervention set selection skills. It is also intended to serve as a spark of inspiration for future researchers to further test and formalize the ideas informing the substantive theory of intervention set selection. A job aid is provided to assist readers in their application of the intervention set selection substantive theory. See *APPENDIX*

C. Intervention Set Selection Job Aid for a quick reference guide on how to engage in the intervention set selection process using the components of the substantive theory provided.

Lesson 5 – Substantive Theory of Intervention Set Selection

The final research question asked: Is there an underlying theory or model that can be developed that explains intervention selection, including specific relationships between performance factors? If so, what is the theory and does it inform intervention selection? The question was answered by the presentation of the substantive theory of intervention set selection in this study. The generated schemata provided the foundation for the types of relationships that exist between performance factors. By identifying the actions involved in the intervention set selection process, the substantive theory of intervention set selection enhances the understanding of the performance improvement selection process

Limitations

Exemplary case studies provide a unique opportunity to examine the performance improvement process in an exhaustive manner. While no other data source provided an in-depth repository of performance problems in a variety of contexts as did performance case studies, there were limitations to the use of exemplary cases studies as a data source. In this context, *exemplary* refers to how the cases were written, how the practice of performance improvement was

conducted, and how the cases were reviewed and edited for publication. The cases were not subjected to objective critique to determine how typical the performance problem were in the field. Nor was a long term follow up conducted to ensure the intervention set selected in the case worked overtime. These limits do not outweigh the fact that the case studies provided an insight into performance improvement process that would be impossible to capture in real time. Considering the length of time it takes to conduct a performance improvement project, the lack of access outsiders have to proprietary information, and the number of stakeholders involved, it would be extremely difficult and unrealistic to pursue a study of the phenomena of intervention set selection without taking advantage of rich data sources such as case studies. This study was specifically aimed at examining schematic elements of the interventions set selection process and principles that guide the practice, both of which require the researcher to spend time reflecting on the data and constantly compare it to new data in order to develop the substantive theory of interventions set selection.

Implications for Future Research in HPT

By introducing new principles, schemata, and a substantive theory for intervention set selection, this study has expanded the performance improvement field. The findings compel educators, practitioners, and scholars to rethink how performance improvement is taught, studied, and applied, especially the methods and practices of intervention set selection. Instead of skimming over the “how” and “why” of intervention set selection between the analysis phase to the design

phase, the study refocuses the literature on the key component of intervention set selection. The significance of the study rests in the development of a substantive theory and the foundation it lays for future scientific inquiry and formal theory development in HPT. It also has practical and career implications for consultants to consider when engaging in performance improvement and honing their intervention set selection skills. Since each industry has its own distinctions, a consultant should specialize in a particular industry such as education, manufacturing, or healthcare in order to bring added value to clients. As a prerequisite, consultants also should have a strong foundational knowledge and years of practical application in the performance improvement field. The findings also suggest that novice, mid-career, and expert consultants all must make continuous efforts to stay current with new research and practices. Finally, these findings should enable practitioners to better articulate the value of their work to organizations, which is not only a valuable skill but also a necessity for the field. To further solidify the substantive theory of intervention set selection, this study suggests the following research and scholarly endeavors.

An Intervention Set Selection Textbook

An intervention set selection textbook would provide scholars and practitioners, at various experience levels, with core knowledge, research, real world case studies, and best practices associated with intervention set selection. The textbook could also serve as a main source or hub for finding information

about particular interventions or even serve as an encyclopedia or library for interventions sets.

New Case Studies

The basic components of the intervention set selection substantive theory can be examined by using a new set of case studies as the data set. For example, by using new cases a researcher can characterize the interventions sets in each case against the schemata presented in this study to investigate whether they fall into one or more of the schemata. The researcher can also examine whether or not the consultants in the case abided the principles outlined in this study.

Measuring Comprehensiveness and Longevity

An objective of the intervention set selection process is to select an intervention set that is sufficiently comprehensive enough to reduce a performance gap. A future study could and should measure the correlation between an interventions set's comprehensiveness and a consultant's exposure to the theory, schemata, and principles in this study. Before this could be done, however, scholars would need to develop measurements and standards to assess the comprehensiveness of an intervention set. This future study could also examine whether the comprehensiveness and longevity of an intervention set differs by industry; for example, intervention sets within the information

technology industry may differ from those in the agricultural industry or the healthcare industry.

Expert and Client Inquiry

To investigate the utility of the substantive theory of intervention set selection and its individual components, a researcher can survey or interview experienced consultants in field to see if the theory resonates with their practice. Similarly, a researcher can conduct a study that measures client satisfaction with both consultants who do and who do not abide by the principles offered by this study as well as those that engage their clients in intervention set selection modelling activities throughout their project.

Action Research in Educational Settings

Professors interested in performance improvement, specifically intervention set selection, can introduce the findings of the study to their students. While teaching, the professor can engage in action research techniques to examine student understanding of the theory's three components. For example, one of the obstacles a novice must learn to overcome when first exposed to the intervention selection process is thinking about interventions as a set rather than as a single entity. Using the schemata provided, a professor can more effectively increase students' ability to understand how to select more comprehensive intervention sets.

Reflections

A strength of the grounded theory method is the constant memo writing requirement. Memo writing, or note taking, gives the researcher an opportunity to step back and reflect on ideas and the research process itself. Reflection sessions have proven to be a valuable activity in the generation of ideas throughout this study, including the ideas that lead to techniques such as visualizing interventions sets through modelling techniques and reflecting on schemata and principles to strengthen their utility. Reflection is ongoing and not only involves writing memos but returning to those memos days, weeks, and even months later to cultivate a single idea. As the research ends, it is only fitting that a few final reflections be provided to the reader.

The Role of Reasoning in Intervention Set Selection

The reasoning skills a consultant uses to select an intervention set is similar to the approach a physician uses when selecting a patient's treatment. Eco and Sebeok (1983) state:

> Now a doctor looks both for general laws and for specific and idiosyncratic causes, and a historian works to identify both historical laws and particular causes of particular events. In either cause historian and physicians are conjecturing about the textual quality of a series of apparently disconnected elements. They are operating a *reductio ad umun* [reduction to one meaning] of plurality. (p. 205)

The act of thinking in order to put together seemingly disconnected interventions is at the heart of intervention set selection. The ideas presented in this study force consultants to enhance their reasoning skills. Deductive reasoning allows a

consultant to apply known outcomes to specific performance problems in the form of heuristics and other forms of tested problem solving. Although deductive reasoning is essential to the process, it may become limiting, especially in complex performance improvement situations. While performance problems have similarities, the context of each organization's performance problem is unique. The details of each case faced in the field requires the consultant to also engage in inductive reasoning to select intervention sets. Acquiring and refining inductive reasoning skills is advantageous for experienced consultants since they encounter more complex performance problems in the field. However, it is the abductive reasoning or conjecture thinking that tends to be the most difficult to develop because it involves creativity and intuition. The schemata, principles, and modelling techniques presented in this study should be used to facilitate this type of reasoning. The honing of reasoning skills through practice is what sets an expert apart from a novice. Experience also helps a consultant maintain confidence when faced with limited information.

An Analogy

How a performance consultant selects an intervention set is similar to how a physician selects a treatment. If a patient complains to their physician about a health issue, such as pain in their stomach, it is very rare that the physician will prescribe a single medicine to address the problem without subsequent analysis of the patient's condition. The initial patient analysis consists of the physician making observations and asking questions in order to arrive at a treatment based

on the evaluation of the patient's conditions. This is similar to what a performance improvement consultant refers to as the analysis phase and is typically done with the aid of diagnostic and process models.

Analysis and intervention set selection work in tandem to power the final intervention set the practitioner selects, designs, develops, and implements. Just as a physician selects a course of treatment based on a prior experience, a consultant's analysis informs his or her intervention set selection. The two processes converge when a consultant's analysis questions leads the consultant to check and confirm their assumptions about a particular performance problem. This suggests that the first component of the intervention set selection substantive theory, comprehension of the situation, has begun and that the consultant is engaging the second and third components.

Similar to the physician illustration, as the consultant asks more questions, they also draw upon their prior experiences; that is, a cluster of interventions or problems they have encountered in the past. Drawing upon previous experiences activates the various schemata presented in this study. The schemata continuously change as a consultant answers new questions about the performance problem, allowing the intervention set to take shape. Returning to the example, the consultant also seeks guidance or advice from other sources just as a medical doctor may turn to physician's reference books or electronic database references. For the performance consultant, these references may also come in the form of books on interventions and classification of models as well as journal articles and case studies in *Performance Improvement*, *Performance*

Improvement Quarterly, and journals in other fields. If a treatment is not selected after referring to the literature, the physician may then contact other experts and colleagues in their network who are familiar with other specific cases of the problem and can provide insights into how to proceed with diagnosing and selecting a treatment. While this is taking place, the consultant's schemata are changing as they accommodate and assimilate the new information to further comprehend the situation and select an intervention set. In turn, this engages the second component of the substantive theory of intervention set selection: activating schemata to synthesize an intervention set.

Reasoning is necessary for a consultant to adjust and to accommodate the contextual intricacies of each performance problem. Similar to rare illness cases, the treatments are not straight forward. A patient's treatment may be experimental, regimented, and conducted over a period of time and requiring follow-up visits for further observation. When prescribing a medicine, a medical doctor may emphasize the need for other treatment recommendations such as adequate rest, exercise, and increased water intake since they may aid in the effectiveness of the prescribed medicine. Similarly, throughout the intervention set selection process, a consultant needs to adhere to governing principles when making their recommendations so their intervention sets are properly implemented and most effective in solving the performance gap. This study's principles serve in the same capacity as the principles physicians should follow when recommending treatments to patients.

Connections Between the Field of HPT and Design

The power of human performance technology rests in its ability to be applied to an array of organizations and human endeavors (Tosti, 2005). Similar to the field of HPT, "...design touches nearly every aspect of our experienced world" (Nelson & Stolterman, 2014, p. 12). As noted in the literature review, HPT, specifically the process of intervention selection, is rooted in other bodies of knowledge such as systems theory and diffusion of effect. While connections between analysis, intervention selection, design, and development are noted in HPT literature, this study's findings suggest the development of the substantive theory of intervention set selection has produced interesting links between the field of HPT and design that have not yet been explored. Connections between the two fields include designers and performance consultants' similar methods of:

- developing expertise;
- activating schemata;
- focusing on composition,
- balancing the arts and sciences (tacit knowledge and data); and
- taking responsibility for work.

Connection 1: Developing expertise

The process of becoming an expert performance consultant is similar to that of other professions that requires a combination of scientific knowledge and creative skills, such as a physician, engineer, architect, and a designer. Design scholars Nelson and Stolterman (2014) provide orders of design learning which include:

- “Truth and reality,” which stems from data, information, and knowledge;
- Systemic, which focuses on “finding meaning;”
- Schemata, which involves “making meaning” through “systems analysis;”
- “Composition/assembly,” which involves creating value or connections;
- “Guarantor of destination/design,” which focuses on the how, why, when, and who of design; and
- “Guarantor of direction/destiny,” which focuses on value, desire, and the individual’s perspective (p. 235).

The path to expertise for performance consultants parallels that of designers. Both face dynamic and complex problems that require rigorous thought and skill as well as systems thinking to address them. To be considered an expert, an individual may be expected to address a problem that has limited precedents to reference. Consequently, to address the problem an individual requires formal training as well as experience (Nelson & Stolterman, 2014).

Connection 2: Activating schemata

Analysis is required before the selection of an intervention set, demonstrating that a performance consultant does not engage in selection purely by instinct. The findings of this study demonstrate that the analysis phase directs the consultant to observable performance factors, thus laying the foundation for activating particular intervention set schemata. Although not fully developed, the connection between the intervention selection phase and the analysis phase is well noted in HPT literature. Scholars have yet to fully explore the links between

the substantive theory of intervention set selection and the design process. Performance scholars can gain insights into the design literature from Lawson (2004) who inquires about the use of schemata and precedents when designers are presented with new challenges. Similarly Nelson and Stolterman (2014) argue that:

> The design process is not an algorithm, not a heuristic search pattern, and not a list of prescriptive steps. It is an approach to dealing with the uncertainties and complexities of reality that a designer is thrown into at the beginning of each new project, which continue for the duration of the designer's involvement (p. 241).

Performance consultants design around schemata in tandem with continued analysis, design, and development in order to build a more comprehensive intervention set as they progress. In the future, HPT scholars may want to examine the interdependent relationship between design and intervention selection through schematics, specifically an examination of how characteristics of each intervention are designed around the initial intervention set.

Connection 3: Focusing on composition

The process of intervention set selection provides an opportunity for scholars to examine how the field of HPT and design parallel each other in ways not previously considered in the past. Nelson and Stolterman (2014) argue that:

> Understanding creative acts to be a form of compositional assembly, we can now see how many activities—not commonly considered as such—are acts of design. For example, the formation of public policy, the creation of new educational programs and curricula, the formation of intentional communities of interest, the development of entrepreneurial business plans, the design of one's own life, or the development of a new philosophy of life, are all compositional assemblies—in other words, designs. (p. 161)

Composition is a fundamental concept to both intervention set selection and design. Composition schemata are the first schemata to be activated during the intervention set selection process and are the basis for uniting particular interventions to make a set. As noted in this study, it is rare to have a single intervention address a performance problem, and yet novices or unskilled consultants may frequently make this mistake during the intervention selection phase.

Connection 4: Balance data and tacit knowledge

Intervention set selection initiating Principle 3 advises a performance consultant to appropriately balance the use of data resulting from analysis and his or her tacit knowledge. The two types of knowledge should not be viewed as dichotomies, but as counterparts working together to energize the intervention set selection phase. In the design field this is known as the struggle for balance between art and science (Nelson & Stolterman, 2014; Cross, 2011). Future scholarship could examine in more detail what it means to create equilibrium within an intervention set using art and science.

Connection 5: Taking responsibility for work

The term “guarantor of design” is used in the design field to express the idea of the responsibility a designer accepts or rejects in relation to the works produced (Nelson & Stolterman, 2014). Regardless of the term used, the

question of who is ultimately responsible for the product of a design is still open for debate in the design field. Nelson and Stolterman (2014) argue:

> Now, more than ever, there is a need for serious dialogue on design responsibility; especially given the speed with which we are designing new hard and soft technologies that radically change the foundations, structure, and dynamics of our social reality, as we know it. Even if each individual designer's creation is not primarily responsible for the totality of the changes brought by new designs, that totality is an emergent consequence of each small design's contribution. Therefore, every designer plays an important and significant part in the designed world in which we all live. (p. 212)

Unlike the design field, principles of intervention set selection definitively asserts that a performance consultant has a responsibility to the client. It is the responsibility of the performance consultant to inform the client of the intentional or unintentional impact the selected intervention set may have on other parts of the organization and its surrounding community. This allows the client to anticipate new developments and needs while sustaining a healthy client consultant relationship.

The Voice of the Researcher

This study confronts readers with ideas that will force the expansion of scholarly thinking in HPT. To truly move these findings from theory to meaningful human improvement contributions involves collective scholarly energy and individual commitment. The challenge for consultants and scholars now is to apply these findings to practice, teaching, and research. This requires the integration of schemata, principles, and the substantive theory of intervention set selection into ideas, terminology, practice, research, and teaching. Future

decisions will rely more on data driven points of reference, and HPT scholars must meet this challenge directly by producing research in the field of HPT. While adopting intervention set selection is essential for the advancement HPT, it is also necessary for the reduction of persistent human problems that are detrimental to organizational and societal improvements. In daily life one can see skill and knowledge interventions being presented as the main, if not the only, interventions for addressing issues such as gender inequality, environmental pollution, generational poverty, and correctional institution recidivism. Human performance problems are becoming more complex and the interventions sets needed to address them will require depth, breadth, and impact with higher return rates. Solely relying on skill and knowledge interventions as a planned panaceas for addressing human performance problems is no longer sufficient and to some extent negligent. Such myopic thinking impedes innovation. The researcher urges individuals in academia, business, government, and the nonprofit sector to adopt the substantive theory of intervention set selection and build upon its principles and schemata to improve the future for all humanity.

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APPENDIX A: LIST OF CASES

List of Cases in Sample

Case #	Organization	Citation (Author, Date, Case Name, & Publication)
1	International Oil Company	Payne, R. (1994). Improving customer service skills: International oil company. In J. J. Phillips (Ed.), *Measuring return on investment* (Vol. 1, pp. 169-185). Alexandria, VA: American Society for Training & Development.
2	Yellow Freight System	Zigon, J. (1994). Performance management training: Yellow freight system. In J. J. Phillips (Ed.), *Measuring return on investment* (Vol. 1, pp. 253-269). Alexandria, VA: American Society for Training & Development
3	Peabody Processing, Inc.	King, S. B. (1998). Improving roll changeover performance in a manufacturing organization. In W. J. Rothwell & D. D. Dubois (Eds.), *Improving performance in organizations* (pp. 111-126). Alexandria, VA: American Society for Training & Development.
4	Electric Service Company	Whalen, J. P. (2000). Enhancing job performance through performance analysis and consulting. In J. J. Phillips (Ed.), *Performance analysis and consulting* (pp. 93-107). Alexandria, VA: American Society for Training & Development.
5	Hospital	Finnegan, G. (2000). Getting results: Improving process & people performance. *Performance Improvement*, 39(2), 10-21.
6	COPASA MG	Davis, J. R., & Cerqueira, D. A. (1999). Assessing the results of training: The case of water sanitation in Brazil. In T. K. Hodges (Ed.), *Measuring learning and performance* (pp. 107-114). Alexandria, VA: American Society for Training & Development.
7	Western Digital	Rekomd, P. V. (1998). Improving Instructor Performance Western Digital. In B. M. Sugrue, & J. Fuller, *Performance interventions: Selecting, implementing, and evaluating the results* (pp. 207-218). Alexandria, VA: American Society for Training & Development.
8	Steelcase, Inc.	Wykes, M., March Swets, J., & Rynbrandt, L. (2000). Performance analysis: Field operations management: Steelcase, Inc. In J. J. Phillips (Ed.), *Performance analysis and consulting* (pp. 135-153). Alexandria, VA: American Society for Training & Development.
9	Century 21	Strayer, J., & Rossett, A. (1994). Coaching sales performance: A case study.*Performance Improvement Quarterly*, 7(4), 39-53.
10	PAT Model	Kunneman, D. E., & Sleezer, C. M. (2000). Using performance analysis for training in an organization implementing IS0-9000 manufacturing practices: A case study. *Performance Improvement Quarterly*, 13(4), 47-55.
11	Oregon Department of Transportation	Navran, F. J., & Forbes, D. E. (1995). Pride in public service: Oregon department of transportation. In J. J. Phillips & E. F. Holton III (Eds.), *Conducting needs assessment* (pp. 165-187). Alexandria, VA: American Society for Training & Development.
12	Mississauga Transit	Plant, T. E., & Douglas, J. S. (2003). Strategic performance measurement: The case of Mississauga Transit. *Performance Improvement*, 42(5), 20-27.
13	Texaco	St. Clair, S., & Sharp, J. (1998). Taking measures beyond monitoring to driving performance. In T. J. Esque & P. A. Patterson (Eds.), *Getting results: Case studies in performance improvement* (Vol. 1, pp. 119-128). Amherst, MA: HRD Press.

Case #	Organization	Citation (Author, Date, Case Name, & Publication)
14	Fortune 100 Company	Johann, B., & Patterson, P. A. (1998). Organization effectiveness and training partnering to improve business results. In T. J. Esque & P. A. Patterson (Eds.), *Getting results: Case studies in performance improvement* (Vol. 1, pp. 129- 137). Amherst, MA: HRD Press.
15	Sonoco	Maloney, R. & Smith, D.A. (2001). Sonoco. In Carter, L., Giber, D., & Goldsmith, M. (Eds). *Best practices in organizational development and change* (pp. 419- 437). San Francisco, CA: Jossey-Bass/Pfeiffer.
16	Semiconductor Manufacturer	Patterson, P. A., & Horowitz, D. (1998). When western performance improvement looks east. In T. J. Esque & P. A. Patterson (Eds.), *Getting results: Case studies in performance improvement* (Vol. 1, pp. 193-200). Amherst, MA: HRD Press.
17	Andersen Consulting	Gersting, A., Ives, B., & Gordon, C. (2000). A human performance approach to knowledge management. In J. J. Phillips & D. Bonner (Eds). *Leading knowledge management and learning* (pp. 23-38). Alexandria, VA: American Society for Training & Development.
18	MTR Corp.	ASTD. (1998b). MTR corporation: Performance consulting for better supplier management. In S. Cheney (Ed.), *Excellence in practice* (Vol. 2, pp. 99-106). Alexandria, VA: American Society for Training & Development.
19	MARKEM Corp.	ASTD. (1998a). Markem corporation: High performance teamwork. In S. Cheney (Ed.), *Excellence in practice* (Vol. 2, pp. 83-92). Alexandria, VA: American Society for Training & Development.
20	Wireless, Inc.	Jimenez, R. (2002). Managing employee retention through recognition. In J. J. Phillips & P. P. Phillips (Eds.), *Retaining your best employees* (pp. 17-28). Alexandria, VA: American Society for Training & Development.
21	Maverick, Inc.	Clemmer, R. (1995). Safety problems: Maverick Inc. In J. J. Phillips & E. F. Holton III (Eds.), *Conducting needs assessment* (pp. 33-48). Alexandria, VA: American Society for Training & Development.
22	National Paper	Albert, Michael. (1994). Evaluating an organization development program. In J. J. Phillips (Ed.), *Measuring return on investment* (Vol. 1), (pp. 33-42). Alexandria, VA: American Society for Training & Development.
23	AERA, Inc.	Ravishankar, L. P. & Russ-Eft, D. F. (1995). Quality skills needs assessment. In J. J. Phillips & E. F. Holton III (Eds.), *Conducting needs assessment* (pp. 207-226). Alexandria, VA: American Society for Training & Development.

APPENDIX B: CASE ANNOTATIONS

Preface to Case Annotations

Under the guidance of Indiana University Professor James A. Pershing, PhD, a Human Performance Technology (HPT) research group of five doctoral students at Indiana University worked with a similar dissertation methodology and similar sample of cases as they conducted their dissertation research. This appendix, which includes a methodological preface and 30 separate case annotations, is a document created to be a stand-alone piece that is replicated in each student's dissertation. All other elements of the students' dissertations are independently written and prepared.

The students who collaborated with Professor Pershing to create rich, descriptive case annotations are listed here in alphabetical order by last name:

1. Patricia Capps
2. Gregory C. DeSarro
3. Erika R. Gilmore
4. Sung Pil Kang
5. Mark J. Lauer

The method of developing the individual case annotations involved first creating a template to capture detailed information about each case, including the case number, title, author(s), organization and associated industry classification code, performance need, context and setting, case intervention(s), results, and the case source.

Each case was read by all students and Professor Pershing. Subsequently each student selected six cases and completed the template using direct content from the case as much as possible to create the annotation with authentic content information; original case authors are credited within each annotation. To ensure consistency in documenting the type of organization represented in the cases, the students consulted the Bureau of Labor Statistics' Standard Industry Classification listing to obtain codes and descriptors. After the first annotator finished creating each annotation, he or she submitted the annotation to a second annotator for review. Upon reconciliation of any edits and suggestions, each case was submitted for a third independent review before being considered finalized and distributed to all students for inclusion as an appendix to their dissertation document. This three-person approach was designed to ensure content accuracy and completeness in each case annotation.

Internal Case Code #	> #1
Case Title	> Improving Customer Service Skills
Organization	> International Oil Company
Author(s)	> Payne, R.
Industry Classification	> 5171 Wholesale – Petroleum Bulk Stations & Terminals
Need	> Dispatchers were not performing to the company's expectations; they were not working together as a team, were not double-checking orders, had poor telephone etiquette, had excess absences, were poor problem solvers, had poor relations with their dealers and customers, did not communicate well with each other, and had too many gasoline pullouts. Goals were to reduce delivery costs, improve customer service results, and improve dispatcher attitudes.
Context and Setting	> Evaluation was conducted at an oil company's Los Angeles, CA central dispatch center. This center employed 11 dispatchers and a delivery supervisor. The dispatchers were responsible for assisting service station dealers who were unable to use the automated gasoline-ordering system.
Intervention(s)	> Established standards and processes dispatchers. Designed, developed, and implemented a seven-module training course with an application objective for each module that addressed one of the issues identified in the training needs analysis. Also provided job aids.
Results	> In the first 11 months after training, there was: • A net benefit of approximately $300,000 • A reduction in pullouts, saving the oil company $354, 750 • A reduction in absenteeism, saving the oil company $4,000 • An 85 percent reduction in customer complaints, saving the oil company $1,900 • Decreased dealer complaints • Letters and phone calls from dealers recognizing the dispatchers' improved performance • Classroom-taught knowledge and skills successfully being applied on the job • Dispatchers accomplishing all learning objectives • An overall increase in dispatchers' job satisfaction
Source	> Phillips, J. J. (Ed.). (1994). *Measuring return on investment (Vol. 1)*. Alexandria, VA: American Society for Training and Development.

Internal Case Code #	#2
Case Title	Performance management training
Organization	Yellow Freight System
Author(s)	Zigon, J.
Industry Classification	4210 Trucking & Courier Services (No Air)
Need	A high level of employee job security resulted in lower levels of job performance. Causes for the lower levels of performance were varied: individual employees below the managerial level lacked individual performance measures. These same employees lacked basic performance feedback. Being allowed to keep one's job was the primary reward for performance. Training was mainly observational, followed by self-taught OJT. Overall, Yellow Freight needed to capitalize on labor productivity improvement potential.
Context and Setting	Yellow Freight, a union carrier, had more than 450 locations and 22,000 employees organized into five regions. In a newly deregulated and increasingly competitive industry environment, the best employees were leaving the company for better positions at Yellow Freight's competitors. Top management at Yellow Freight concluded that only the largest companies with the best performing employees would survive deregulation and subsequent price pressures and competition with the smaller companies in the sector.
Intervention(s)	Interventions included strategy re-formulation, route expansion, and reorganization of the transportation system. This led to establishment of performance measures and standards for branch managers, sales representatives, and frontline supervisors. Following a needs analysis, the order of priority for targeting improved employee performance was determined to be branch managers, sales representatives, and supervisors. These groups received a full-scale employee training program. Yellow Freight also hired a Manager of Human Resource Development (HRD) and upgraded the performance appraisal system by creating performance standards, feedback systems, and rewards. Training and job aids supported the new performance system. Additionally, technical skills and knowledge training was provided to reduce the time needed to master every job.
Results	Yellow Freight's program was evaluated on reaction, learning, use, and performance levels. On the reaction level in Phase I, 1,046 managers completed the program and rated the program at 4.9 out of 5 on a five-point scale when asked "how useful and relevant" the training had been. Evaluating if learning took place, of the 1,046 managers, 1,043 met the completion requirement of 8 out of 10 criterion tests passed, for a success rate of 99.7 percent. Eighty-eight percent of the managers provided proof they were using the skills on the job. Ninety-two percent of 249 terminals (49 percent of the entire system) reported improved performance attributed to an increase in performance management skills. The financial benefit of the program was estimated at over $20.8 million.
Source	Phillips, J. J. (Ed.). (1994). *Measuring return on investment* (Vol. 1). Alexandria, VA: American Society for Training and Development.

Internal Case Code #	#3
Case Title	Improving roll changeover performance in a manufacturing organization
Organization	Peabody Processing Incorporated
Author(s)	King, S. B.
Industry Classification	3310 Steel Works, Blast Furnaces & Rolling & Finishing Mills
Need	Production of new higher-margin, lower-volume specialty products required Peabody to master quick changeover of a critical piece of equipment, the Temper Mill. The Temper Mill was a bottleneck, unable to operate at the pace of demand.
Context and Setting	Peabody Processing Inc., a unionized steel-processing company with approximately 280 employees in the eastern United Stated changed its strategic direction to capitalize on an emerging higher-profit-margin specialty product market. These higher-margin products were produced at lower volume levels. Reducing machine changeover time was critical to the company's success, as product runs needed to be shortened from spanning multiple shifts to spanning a matter of several hours.
Intervention(s)	Employees learned the difference between internal and external changeover tasks. This enabled them to assist with process redesign for quicker changeover. Equipment and tools were also modified to facilitate the improved changeover process. Performance goals and standards were set to track and reduce changeover time, increase pride in job performance and save money. A final intervention category is the establishment of a feedback system. Bulletin boards were introduced for employees to post changeover times. This was done to track and celebrate performance, as well as communicate any difficulties in reducing changeover times. Leaders was also very engaged early to ensure project success, which included providing feedback and establishing a strong relationship with maintenance to help implement changes.
Results	After six months, there was a 50 percent reduction in changeover time. This average improvement of 45 minutes resulted in a savings of $22,880. In addition, this improvement resulted in production hours being freed up for running other products. A sense of excitement among the team and organization was also reported as being present as performance improvement was achieved. The team reported safer work practices and improved morale as benefits beyond the cost savings and productivity improvements.
Source	Rothwell, W. J., & Dubois, D. D. (Eds.). (1998). *Improving performance in organizations.* Alexandria, VA: American Society for Training & Development.

Internal Case Code #	> #4
Case Title	> Enhancing job performance through performance analysis and consulting
Organization	> Electric Service Company
Author(s)	> Whalen, J. P.
Industry Classification	> 4911 Electric Services
Need	The Western Regional Call Center was experiencing a high volume of customer complaints due to slow response time and poor customer service. In addition, the customer service representatives (CSRs) were making credit and collection decisions with delinquent customers on an inconsistent basis.
Context and Setting	The Electric Service Company is an electrical service provider in the Southwest United States that had recently closed its local offices and opened three integrated call centers to handle all customer enquiries. Each call center employed approximately 85 customer service representatives (CSRs). To support these new CSRs, the company had implemented an integrated online reference system (ORS) that provided tutorial information on customer accounts, internal scheduling information, and procedural guidelines.
Intervention(s)	> Electric Service Company hired an outside consulting company to conduct a comprehensive performance and needs analysis. Interventions recommended from the analysis included restructuring of performance measures, goals, and incentives. Additionally, ORS updates and upgrades, job aids for credit guidelines, improved leader-to-employee coaching practices, and training were identified as solutions. Note: Two of the proposed interventions were not implemented immediately: the management incentives restructuring and update of ORS.
Results	> During a three month pilot, the successful increase of log-off goal from 90 seconds to 120 seconds yielded an undesired increase in customer wait time, no change in lost call volume, and a desired decrease in customer callbacks. In addition, a cost avoidance calculated as a result of conducting the front-end analysis was $14,319 because the company was advised to conduct a half-day skills training program (one of the recommended solutions) as opposed to a two-day training program the company initially planned. This data point helped generate support for additional analysis. The cost of delinquent accounts decreased 37.3 percent, for an annual projected savings of $60,977. Customer callbacks and correspondence decreased 16 percent, exceeding management expectations. Additional analysis of turnover and management skills was commissioned based on the early pilot successes.
Source	Phillips, J. J. (Ed.). (2000). *Performance analysis and consulting*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	> #5
Case Title	> Getting results: Improving process & people performance
Organization	> Hospital
Author(s)	> Finnegan, G.
Industry Classification	> 8060 Services – Hospitals
Need	This case presents four different performance scenarios in a single organization: 1. Inaccuracies in operating room charges yielded reduced revenue. 2. Some specimens collected by nurses or residents were inadequate for lab processing; communication between lab and nurses and physicians regarding processing and blood draws was inadequate, 3. A new care delivery model was planned for hospital staff roles and responsibilities in patient care units. Successful initiation of the model was needed; the coordination and understanding of new and revised roles by the care team was key to success. 4. In numerous instances, the physical location of radiological films could not be determined in a timely manner.
Context and Setting	The setting is a hospital, with specific focus on departments including operating rooms, nursing units, labs, admitting, and radiology. A six-element performance system model is actively used to characterize the hospital's performance improvement needs.
Intervention(s)	Multiple interventions were devised for each of the performance scenarios: 1. The operating room charge process redesigned; charge sheets redesigned and the review process modified; and revenue graphed weekly. 2. Specimen collection process redesigned; lab activity books created; training sessions held to support changes; phone communication organized and formalized; and a job aid made for tube selection and special conditions. 3. Job aids and training for the new care model created. Feedback systems developed, including regular briefing meetings for people in new or revised roles to meet face to face and review their work. Also, pre-op testing before surgery introduced. 4. New process defined for film movement and tagging, as well as implementation of daily feedback on film processing and a film processing scorecard.
Results	1. Operating room charges were more accurate, resulting in $750,000 annualized revenue increase. 2. An 80 percent reduction in reports of unsuccessful draws and lab processing problems; 42 percent reduction in labeling issues; an 83 percent reduction in leaking containers; and 51 percent reduction specimens that could not be processed. 3. Eighty percent of all issues identified in meetings were resolved in the meeting, and 13 percent were resolved before the next meeting. The remaining issues took more than one week to resolve. The pre-op testing review resulted in fewer surgeries being cancelled the day of surgery because of negative pre-op testing. 4. Process flow was developed and supplemented by secretaries keeping film logs, labeling films, and reconciling for improved ability to identify film location.
Source	Finnegan, G. (2000). Getting results: Improving process & people performance. *Performance Improvement, 39*(2), 10-21.

Internal Case Code #	> #6
Case Title	> Assessing the results of training: The case of water sanitation in Brazil
Organization	> COPASA MG
Author(s)	> Davis, J. R. & Cerqueira, D. A.
Industry Classification	> 4941 Water Supply 4950 Sanitary Services
Need	> Need to provide safe drinking water to the interior of Brazil. To achieve this, effective testing of water quality is inquired. Inspectors needed to be trained to correctly collect samples and operate a water testing device to accurately assess the quality of water in their rural areas.
Context and Setting	> Companhia de Saneamento de Minas Gerais (COPASA MG) is a large sanitation company that provides safe drinking water to the state of Minas Gerais and to the third largest city in Brazil, Belo Horizonte. The state of Minas Gerais has a population of 13.1 people with 3.7 million people living in rural areas. Providing high-quality drinking water in remote and rural areas of Minas Gerais is a challenge.
Intervention(s)	> To increase bacteriological control of water supplies and improve response time to incidences of contamination, COPASA MG implemented a program to test water supplies on-site in rural areas. Local water inspectors were identified and sent to a regional center for training and assessment; they were required to pass a basic color acuity test, learn how to take water samples, mix and add testing powder, place samples in an incubation box, and then accurately read samples for coloration. All participants must achieve a 100 percent score on all written and practice tests. In addition to the training and tools, two month and three month follow-up processes were developed along with recordkeeping processes. A second phase of training was implemented on a quarterly frequency at the regional center.
Results	> COPASA MG achieved maintenance of 100 percent bacteriological control of the water supply in its area. The response time to identified problems was reduced. In addition, mailing of water samples from small systems to nearby laboratories decreased due to on-site testing capability. The entire program produced positive results.
Source	> Hodges, T. K. (Ed.). (1999). *Measuring learning and performance*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	#7
Case Title	Improving Instructor Performance Western Digital
Organization	Western Digital
Author(s)	Rekomd, P. V.
Industry Classification	423430 - Merchant wholesale distribution of modems and other electronic communications equipment
Need	User were unprepared to use the new system.
Context and Setting	A Fortune 500 company in the high-technology industry was implementing an Enterprise wide data warehouse.
Intervention(s)	>1. New Software Certification process 2. Instructor role design 3. Instructor class schedule (workload) 4. Project Head Action 5. Instructor Evaluation Feedback 6. Recognition 7. Positive comments during weekly staff meetings 8. Certification Test 9. Outlook scheduling program 10. Evaluation form 11. Bulletin Board 12. Instructor job description 13. Posting Instructor Evaluation score 14. Positive class comments 15. List certified participants names
Results	Increased number of certified users of the system. This resulted in a gain of one hour per day of productivity or $10,000 per year in productivity per person which is approximately $1 million of productivity gain in the first year.
Source	Sugrue, B. M., & Fuller, J. (1999). *Performance interventions: Selecting, implementing, and evaluating the results*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	> #8
Case Title	> Performance analysis: Field operations management
Organization	> Steelcase, Inc.
Author(s)	> Wykes, M., March Swets, J., & Rynbrandt, L.
Industry Classification	> 2520 Office Furniture
Need	> Provide clarity for the field operation manager (FOM) job role and improve performance of FOMs. FOMs work directly with selected service providers and maintain profitability by assessing development needs and by coaching service providers who need help with specialty *furniture management* as they deal with end-user customers.
Context and Setting	> A global company with annual sales of $3 billion and 21,000 employees in 15 countries. Steelcase works with a network of approximately 700 independent dealers who are in direct contact with end customers. The broadening of the office furniture industry's emphasis on helping customers increase productivity through space and furniture resulted in the new notion of *furniture management* becoming a substantial profit element for Steelcase. The FOM role is key to supporting *furniture management*.
Intervention(s)	> Performance analysts compared *what is* with *what should be* in terms of the work behavior of the FOMs to identify the performance gaps. Solutions centered on developing a performance model, creating personal development plans for FOMs, clarifying expectations, documenting processes, implementing appropriate measures and incentives, creating a service provide selection and assessment process, communicating results, and creating FOM team leader and operations administrator positions.
Results	> The interventions yielded multiple results: • Clarified FOM roles • Let FOMs share more information regularly • Improved selection and assessment process of the service providers • Decreased time between defect detection and defect remedy • Increased the number of FOMs with individual improvement plans from 20 percent to 90 percent • Increased employee satisfaction
Source	> Phillips, J. J. (Ed.). (2000). *Performance analysis and consulting*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	> #9
Case Title	> Coaching sales performance: A case study
Organization	> Century 21 Real Estate Corporation
Author(s)	> Strayer, J. & Rossett, A.
Industry Classification	> 6531 Real Estate Agents & Managers
Need	> New sales associates had a high drop-out rate and a low productivity rate. Need to construct a support system for new sales associates to practice job skills and endure inevitable rejections.
Context and Setting	> The real estate corporation with 6000 offices across the continent contacted an consultant with a request to develop training to help new real estate sales associates become productive quickly. At a meeting of the corporation's regional directors, the executives decided to begin a systemic effort to achieve their goals, which included a needs assessment and introduction of a new sales coach role in the organization.
Intervention(s)	> Created a new coach position in each office. Conducted a needs assessment using focus groups and interviews. The needs assessment led to the design of the CENTURY 21 Sales Performance System. The performance system included materials and audiotapes for sales associate development, a coaching system for new associates, an instrument and process for coach selection, incentives, integration activities for associates, and training for coaches and associates.
Results	> Sales associates who participated in the program increased their productivity with decreased listing time and increased revenue. Both coaches and protégés reported high satisfaction with the program and rated the program to be very effective and useful. The greatest perceived benefit of the program was reported to be the increased self- confidence among new sales associates.
Source	> Strayer, J., & Rossett, A. (1994). Coaching sales performance: A case study. *Performance Improvement Quarterly, 7*(4), 39-53.

Internal Case Code #	>	#10
Case Title	>	Using performance analysis for training in an organization implementing IS0-9000 manufacturing practices: A case study
Organization	>	ISO-9000 manufacturing company
Author(s)	>	Kunneman, D. E. & Sleezer, C. M.
Industry Classification	>	2761 Manifold Business Forms
Need	>	Implement ISO-9000 and improve performance to meet ISO standards for ongoing business results. Establish a formal orientation program for current and new operators in the chemical department.
Context and Setting	>	A large manufacturing site within a global manufacturing company specializing in forms and business systems design. The site employs 154 people and produces adhesive for various label products.
Intervention(s)	>	Conducted a performance analysis to identify the ideal work behaviors for operators, document actual work behaviors, and identify barriers to performance. Applied Performance Analysis for Training (PAT) model that identifies the interactions between the organization's characteristics, and the decision maker's characteristics, and the analyst's characteristics. In addition to documenting work processes and communicating expectations for how production work should be done, training was conducted to teach employees the new standard operating procedures.
Results	>	The performance analysis resulted in the identification of ideal work behaviors, the documentation of actual work behaviors and the identification of barriers to performance. It also facilitated understanding the knowledge and competencies required to improve operator performance and highlighted skills already existing in the organization of which decision makers were not previously aware.
Source	>	Kunneman, D. E., & Sleezer, C. M. (2000). Using performance analysis for training in an organization implementing IS0-9000 manufacturing practices: A case study. *Performance Improvement Quarterly*, *13*(4), 47-55.

Internal Case Code #	> #11
Case Title	> Pride in public service
Organization	> Oregon Department of Transportation (ODOT)
Author(s)	> Navran F. J. & Forbes, D. E.
Industry Classification	> 4700 Transportation Services
Need	> Change the corporate culture to understand and support an ethics enhancement.
Context and Setting	> ODOT, with nearly 5000 employees, was reorganizing to decentralize and working to adjust its mission to being a *transportation* organization instead of a *highway construction and maintenance* entity. ODOT had been undergoing a restructuring for several years, but it still had a stiff hierarchy and narrow span of control wherein a few managers held much decision making power. Leaders found a significant lack of an ethical context for decision making in the organization.
Intervention(s)	> Designed and implemented a needs analysis that served as an ethics project outline. Techniques included personal interviews, focus groups, and a written survey.
Results	> Suggested that the corporation undertake the following actions: • Redefine the department's values and priorities • Rewrite the department's ethics policies • Create an ethics oversight committee • Develop an ethics hot line • Initiate whistle-blower protections • Create a decision making process usable by and useful to all employees irrespective of educational or reading level • Develop communications and education strategies Recommendations specific to ethics training for employees included: • A training follow-up strategy to reinforce transfer of training • Evaluate the training effectiveness • Develop feedback mechanism to facilitate organization learning • Use a posttest to assess the long-term effectiveness of the earlier interventions • Identify new, emerging issues
Source	> Phillips, J. J., & Holton III, E. F. (Eds.). (1995). *Conducting needs assessment*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#12
Case Title	>	Strategic performance measurement: The case of Mississauga Transit
Organization	>	Mississauga Transit
Author(s)	>	Plant, T. E. & Douglas, J. S.
Industry Classification	>	4100 Local & Suburban Transit & Interurban Highway Passenger Transportation
Need	>	Improve efficiency and effectiveness, as well as improve productivity and comply with government program requirements. Also a need to improve strategic planning, teamwork, and continuous improvement.
Context and Setting	>	A city government transit system implemented a performance measurement system to improve its productivity and meet the requirements of the 2001 Ontario provincial government's Provincial Municipal Performance Measurement Program. The organization felt pressure to improve.
Intervention(s)	>	Senior management defined strategic goals. Management and employees created performance measures. The new performance measurement system was piloted to assist with creation and implementation of performance measures. The new measurement system contained four phases: measures, strategic goals, continuous improvement, and performance measurement. Accordingly, continuous improvement teams were established, along with formalized feedback mechanisms, a procedure book, and improvements to equipment.
Results	>	The performance measurement system reduced work hours such as maintenance checkup and inspection resulting in annual savings of $100,000. Other results included use of the new brake parts kits, new service truck, new brake tool cart, and the organized brass and electronic connector inventory. Finally, because of these successes the performance management system was awarded the 2001 Corporate Award of Excellence in Continuous Improvement by city leaders.
Source	>	Plant, T. E., & Douglas, J. S. (2003). Strategic performance measurement: The case of Mississauga Transit. *Performance Improvement*, *42*(5), 20-27.

Internal Case Code #	>	#13
Case Title	>	Taking measures beyond monitoring to driving performance
Organization	>	Texaco Refining and Marketing, Inc.
Author(s)	>	St. Clair, S. & Sharp, J.
Industry Classification	>	2911 Petroleum Refining
Need	>	Involve all levels of employees in organizational goals and operate at the top performance quartile of industry standards. Influence the job behavior of a unionized workforce to improve operational efficiency.
Context and Setting	>	Oil refineries in the United States are measured on standards of performance called the Solomon ratings. Performing in the top quartile of the Solomon ratings is a sound competitive benchmark and assures that refining operations are doing everything possible to contribute to corporate success. Prior to the intervention, the refineries were not achieving first quartile performance on three of four critical Solomon measures.
Intervention(s)	>	Established a goal-sharing reward system to share the economic benefits of improved performance with those responsible. Rewards focus on three levels of measurement: plant-wide, workgroup, and individual. Every employee participates and is eligible for rewards or recognition when their team surpasses a target goal. Each employee is individually recognized for their own safety and attendance performances.
Results	>	The OSHA Incidence Rate was cut in half, expenses per barrel were reduced, and the energy usage goals were met.
Source	>	Esque, T. J., & Patterson, P. A. (Eds.). (1998). *Getting results: Case studies in performance improvement (Vol. 1)*. Amherst, MA: HRD Press.

Internal Case Code #	>	#14
Case Title	>	Organization effectiveness and training partnering to improve business results
Organization	>	Fortune 100 Company
Author(s)	>	Johann, B. & Patterson, P. A.
Industry Classification	>	3990 Miscellaneous Manufacturing Industries
Need	>	Reduce the new product development cycle time and specifically the time required to approve engineering documents.
Context and Setting	>	A global division of a high-tech diversified Fortune 100 corporation. In high tech markets, new product development time is critical. If the new product development time is slow, a company can lose whole market segments. The company tried but failed in earlier attempts to reduce product development time. Analysis showed that engineering document approval time was causing significant delays in getting new products to market.
Intervention(s)	>	Mapped as-is process for new product development and established a specific goal for reduction of cycle time. Implemented quarterly town hall meetings for communication. Created an email enabled system, a parallel approval process, and measurable review deadlines. Used accomplishment-based training to teach employees how to use the email system to produce outputs specific to their respective jobs.
Results	>	The engineering document approval time was reduced from 21 days to two days. The accomplishment-based training produced efficient learning and high user satisfaction.
Source	>	Esque, T. J., & Patterson, P. A. (Eds.). (1998). *Getting results: Case studies in performance improvement (Vol. 1).* Amherst, MA: HRD Press.

Internal Case Code #	>	#15
Case Title	>	Sonoco
Organization	>	Sonoco
Author(s)	>	Maloney, R. & Smith, D. A.
Industry Classification	>	2650 Paperboard Containers & Boxes 2673 Plastics, Foil, & Coated Paper Bags 3089 Plastic Products Not Elsewhere Classified
Need	>	Ensure performance management system 1) helps employees support business goals through their work, and 2) fosters employee development.
Context and Setting	>	Large global packaging company with a changing business environment. Acquisitions resulted in re-engineering of company divisions, and each division has a different performance management system.
Intervention(s)	>	New Sonoco Performance Management System (SPMS) to replace existing performance management systems and focus on individual and organizational development. SPMS changes included leadership development, succession planning, competencies, goals, process for linking objectives, and compensation changes; also rewards, newsletter, online tools such as 360 degree feedback, and training.
Results	>	The performance system focused on development and the future rather than only looking backward. Employees became active participants in performance management and chose areas for their own development. SPMS training fostered commitment to the system and reduced resistance at multiple levels. Information from 360 degree feedback allowed monitoring of organizational competencies and provided information to drive organizational performance improvement; some strong improvement needs were identified for executives, along with methods for improvement. Employee feedback enabled changes to further improve the new system, such as simpler forms, a streamlined process, and better training. Less than desired results related to the midyear career planning process and getting all employees to acknowledge that performance management is a routine part of their jobs.
Source	>	Carter, L., Giber, D., & Goldsmith, M. (Eds). (2001). *Best practices in organizational development and change*. San Francisco, CA: Jossey-Bass/Pfeiffer.

Internal Case Code #	>	#16
Case Title	>	When western performance improvement looks east
Organization	>	Semiconductor manufacturing business (anonymous)
Author(s)	>	Patterson, P. A. & Horowitz, D.
Industry Classification	>	3674 Semiconductors and Related Devices
Need	>	Create long-term solutions to reduce an increasingly high number of customer returns. Also need to reduce the number of repeat defects and avoid lost sales due to the company's failure to address and eliminate ongoing defect issues.
Context and Setting	>	A facility in Asia manufacturing semiconductors as part of a $27.9 billion global technology firm based in the United States suffers from increasing customer returns even as product issues are identified and corrected. Efforts to reduce customer returns have been ongoing for years, yet performance continues to decline.
Intervention(s)	>	A front end analysis was conducted including observation, interviews, document review, and a survey, to identify the performance gaps. The identified gaps were: • Problems were identified based on incomplete data which led to incorrect solutions • Teams did not have access to the appropriate experts, leading to more incorrect solutions • Meetings were ineffective due to various factors • Problem-solving methods were rigid and exceeded cost limitations Engineers were organized into five teams based upon the five most common types of customer returns and focused on that one type of problem. Engineers' roles were clarified, work goals were reviewed, and workload was reduced. Work cubicles were redesigned and a conference room was created for better meetings. Teams were given more autonomy regarding their workload and access to resources.
Results	>	Improvements in product returns and costs; customer returns were reduced by 40 percent within six months resulting in a projected yearly savings of $6 million.
Source	>	Esque T. J., & Patterson, P. A. (Eds.). (1998). *Getting results: Case studies in performance improvement (Vol. 1)*. Amherst, MA: HRD Press.

Internal Case Code #	>	#17
Case Title	>	A human performance approach to knowledge management
Organization	>	Andersen Consulting
Author(s)	>	Gersting, A., Ives, B., & Gordon, C.
Industry Classification	>	8742 Services – Management Consulting Services
Need	>	Implement solution(s) to effectively support the human performance required for the success and continuous improvement of knowledge management in the organization.
Context and Setting	>	Global professional services firm with 65,000 professionals working as integrated teams to provide industry expertise and specialized skills to clients. Robust knowledge sharing within the organization is a key tenet of the company's vision and overall business strategy.
Intervention(s)	>	Integration of knowledge management with other learning initiatives and integration of information technology, human resources, and business unit support for knowledge management. Accomplished through organizational structure changes, definition of strategy and procedures, communication tools, rewards and recognition, job aids and training, and computerized tools.
Results	>	Mission, vision, and leadership successfully put in place to support knowledge management. Infrastructure established for global communications, as well as document libraries and discussion forums developed to make knowledge capital available to all. Ongoing refinement and consolidation of knowledge content was supplemented by new methods of accessibility. Ultimately, the organizational result was a tighter and more focused integration of individual and organizational learning, with continuously improving project team performance.
Source	>	Phillips, J.J., & Bonner. D. (Eds.). (2000). *Leading knowledge management and learning.* Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#18
Case Title	>	MTR Corporation: Performance consulting for better supplier management
Organization	>	MTR Corporation
Author(s)	>	ASTD (American Society for Training & Development)
Industry Classification	>	4100 Local & Suburban Transit & Interurban Highway Passenger Transportation
Need	>	Need to maximize business results with fewer resources in an environment where large developments in the environment, such as new towns and an airport, induce change impacting MTR Corporation. Within the organization, MTR identified a need to transition from having a training department to a performance consulting team.
Context and Setting	>	MTR has operated a mass transit railway system in Hong Kong since 1979. The system has 38 stations that cover 43.2 kilometers with an average daily passenger load of 2.38 million. Existing lines can no longer serve demand due to development of new towns and rural areas; a new airport requires a new railway extension between the airport and downtown Hong Kong; and higher customer expectations require station improvement projects to refurbish facilities. MTR also works with a high number of outsourced suppliers and contractors.
Intervention(s)	>	Adopted a performance consulting model. Had meetings with executive managers to define the desired operational outcomes and conducted interviews with staff to determine performance gaps. Reframed staff responsibilities for managing suppliers to close the gaps, and implemented supplier surveys. Implemented an incentive program, a performance management system with tools, and a method for evaluating projects. Five training solutions were also devised: • Value management/value engineering (VM/VE) concepts workshop • Life cycle costing workshop • Partnering process concepts workshop • Managing for project implementation self-study and workshop • Supervising for contractors workshop
Results	>	After the workshops, an average of 10 percent to 15 percent in total project cost savings was realized, translating into $25 million - $50 million. Program participants report having more resources to deal with difficult supplier issues. Other departments expressed a desire to implement the VM/VE process.
Source	>	Cheney, S. (Ed.). (1998). *Excellence in practice (Vol. 2).* Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#19
Case Title	>	MARKEM Corporation: High performance teamwork
Organization	>	MARKEM Corporation
Author(s)	>	ASTD (American Society for Training & Development)
Industry Classification	>	3555 Printing Trades Machinery & Equipment
Need	>	Initiate a corporate culture change so that MARKEM would become a continuous improvement organization.
Context and Setting	>	MARKEM is an eighty-seven year old privately held firm that manufactures specialized printing systems. Through two recent major performance improvement initiatives, workers think that they can discuss the deep-seated issues in their corporate cultures.
Intervention(s)	>	Developed a three day High Performance Teamwork training course to address employee morale and the quality and efficiency of internal operations based on best practices from leading companies including the Seven-Step Problem Solving Method based on the book *The New American TQM*. The intervention was built on two previously successful programs: 1) a planning and controlling system to provide a steady stream of production despite fluctuating demands, and 2) ISO 9001 certification in product consistency that used ISO's corrective action requirements. Following the successful projects employees began to recognize and articulate the inefficiencies in their operating procedures.
Results	>	Training led to a cross-functional opportunity that allows employees to complete a team charter and register to work on a specific project. Teams use Plus/Δ analysis where participants list what worked well (the pluses) and what they would change the next time to strengthen the group's performance (the deltas). Additional results: • New methods saved $500,000 in shipping costs • Reduced milling time for a popular specialty ink by 20 hours • Reduced turnaround time from receipt of order to product shipment by more than seven days • Reduced manufacturing time for a high-demand item from six to three days and subsequently reduced time by an additional eight hours • Reduced central computer transactions by 15,000 • Saved $275,000 in outbound freight costs with new procedures
Source	>	Cheney, S. (Ed.). (1998). *Excellence in practice (Vol. 2).* Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#20
Case Title	>	Managing employee retention through recognition
Organization	>	Fortune 500 wireless communications company
Author(s)	>	Jimenez, R.
Industry Classification	>	3669 Communications Equipment, NEC
Need	>	Improve employee retention, increase leadership, and increase employee motivation and commitment.
Context and Setting	>	The company has been listed in Fortune magazine's "100 Best Companies to Work for in America" for the previous three years as well as the magazine's "100 Fastest Growing Companies" list. In the wireless communication industry, employee retention is critical; therefore, a proactive approach to recognizing workers' retention issues is important. Hired an outside agency to conduct two surveys through telephone interviews to understand why candidates decline offers from the company and why employees leave the company. The company collected extant data from three years of competition in Fortune magazine's "100 Best Companies to Work for" applications to determine why employees stay at the company. These data were gathered originally with a random sample survey
Intervention(s)	>	Human Resources (HR) united the various retention and recognition efforts into one central location under the coordination of HR. The company created an internal website so that employees could access a variety of recognition tools and resources. The company provided elements of the Retention Life Cycle Model to enable managers to match the resource to the employee's tenure.
Results	>	Human Resources (HR) united the various retention and recognition efforts into one central location under the coordination of HR. The company created an internal website so that employees could access a variety of recognition tools and resources. The company provided elements of the Retention Life Cycle Model to enable managers to match the resource to the employee's tenure.
Source	>	Phillips. J. J., & Phillips, P. P. (Eds.). (2002). *Retaining your best employees*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#21
Case Title	>	Safety problems
Organization	>	Maverick, Inc.: A subsidiary of Lornex
Author(s)	>	Clemmer, R.
Industry Classification	>	3585 Air-Conditioning & Warm Air Heating Equipment & Commercial & Industrial Refrigeration Equipment
Need	>	Reduce the high number of accidents reported, 99 percent of which occur in the shop area
Context and Setting	>	Newly acquired family owned and managed custom air conditioning manufacturer for commercial projects (Maverick, Inc.) will be a subsidiary of a larger company (Lornex).
Intervention(s)	>	Develop formal and informal communication channels in order to promote safety and implement an effective safety program. Place more emphasis on the importance of workplace safety by making management floor managers and production employees accountable for safety. Appoint a safety representative in each area and centralize safety records. Provide each new employee with a four-hour safety orientation and provide follow-up training as needed each year, ensuring accurate documentation of training. Post safety signs in shop area and ensure good housekeeping. Create a safety bulletin board and monthly safety award, and implement stiffer penalties for unsafe acts.
Results	>	Senior management's reaction to the safety improvement project and recommendations was positive. The case describes that much effort, commitment, time, and financial resources would be needed to fully implement and realize the potential results from the list of recommended interventions.
Source	>	Phillips, J. J., & Holton III, E. F. (Eds.). (1995). *Conducting needs assessments*. Alexandria, VA: American Society for Training & Development.

Internal Case Code #	> #22
Case Title	> Evaluating an organization development program
Organization	> National Paper Company
Author(s)	> Albert, M.
Industry Classification	> 2631 – Paperboard Mills
Need	> The organization needed to improve its organizational model and management methods to adapt to a changing competitive environment. Specific needs included lowering costs by increasing quality and service, and reducing a high employee turnover rate.
Context and Setting	> A division of 10 manufacturing plants within a major company in the forestry product industry suffered from outdated management methods and culture. This case focuses on one of the 10 manufacturing plants, specifically chosen as a pilot program due to its operational and personnel problems.
Intervention(s)	> An organizational development (OD) program was designed to eliminate the organization's dysfunctional culture, increase productivity, efficiencies, and quality, while reducing waste and improving the safety record. Objectives were developed for the program: • Give individuals an opportunity for involvement, accomplishment, and recognition • Develop a positive work attitude • Maximize utilization of human resources and improve organizational structure • Improve cost effectiveness and increase productivity • Demonstrate bottom-line results Seven major areas constituted Phase I: • Group interviews • Employee attitude surveys • Program introduction workshops • Action study committees • Work teams • Project assignments • Training and developmental activities
Results	> Overall, the organization's culture and management methods improved. Communication improved in the plant with one of the benefits being reduced number and severity of grievances. In addition, the work-team concept had increased workforce unity and fostered a sense of having common goals with management. Annual savings of $106,100 were realized, efficiencies increased in all three production areas, 4 percent, 4 percent, and 2.5 percent, respectively, and waste decreased on average by 2.25 percent. On a monthly average, absenteeism decreased by 35 percent, safety violations decreased by 29 percent, and housekeeping violations decreased by 29 percent.
Source	> Phillips, J. J. (Ed.). (1994). *Measuring return on investment (Vol. 1).* Alexandria, VA: American Society for Training & Development.

Internal Case Code #	>	#23
Case Title	>	Quality skills needs assessment
Organization	>	AERA, Inc.
Author(s)	>	Ravishankar, L. P. & Russ-Eft, D. F.
Industry Classification	>	4931 Electric, Gas, And Sanitary Services – Electric and Other Services Combined
Need	>	Due to increasing foreign competition the company recognized the need to improve quality and chose to deliberately change by focusing on quality throughout the organization. In order to accomplish this they felt that training would play a vital role and that a training needs assessment was critical in aligning the training with the most needed skills.
Context and Setting	>	AER, Inc., a business unit of Western Energy corporation, is in the business of producing power and fuel. With about 100 employees, AER, Inc. is a division of the Alternate Energy and Resources Department. During a conference in 1990 AER, Inc. developed a new mission, quality plan, and core values. A decision was made to provide employees with the skills necessary to implement the quality vision.
Intervention(s)	>	A training needs assessment was performed. The initial focus was to identify specific skills managers would need to move to a flatter and more team-based organization, as they would be the ones to eventually champion the change effort. A new quality plan, mission, and core values statement were developed, along with the formation of a quality council. Additionally, 360 degree feedback reports were used. Basic skills training to implement the new quality vision and a four day certification seminar for instructors were created as well.
Results	>	Positive outcomes included management commitment to the new training, targeting of critical skills gaps, emphasis to managers that attitude and behavior changes from the top down influences success, management visibility to subordinate feedback, and demonstrated commitment to employee involvement. Training was successful, and other gains in safety, reliability, and revenue were realized.
Source	>	Phillips, J. J., & Holton III, E. F. (Eds.). (1995). *Conducting needs assessment*. Alexandria, VA: American Society for Training & Development.

APPENDIX C: INTERVENTION SET SELECTION JOB AID

Purpose of the Intervention Set Selection Job Aid

The intervention set selection job aid presents the three components of the intervention set selection substantive theory:

Components:

1. Comprehending the situation as it relates to the client, the analysis, the problem, and the literature
2. Activating schemata to synthesize an intervention set
3. Adhering to principles

In addition, this job aid summarizes the principles and schemata that support the execution of the intervention set selection process in practice. It serves as a quick reference guide to use when teaching, studying, and practicing intervention set selection. Educators, practitioners, and scholars are encouraged to use the job aid to think through each component of the intervention set selection process. Instead of skimming over the "how" and "why" of intervention set selection in the leap from the analysis phase to the design phase, the job aid helps the user to focus on the key components of intervention set selection. The ultimate goal of the job aid is to help the consultant better communicate the intervention set selection process to their clients and further articulate the value of their work through the process of intervention set selection.

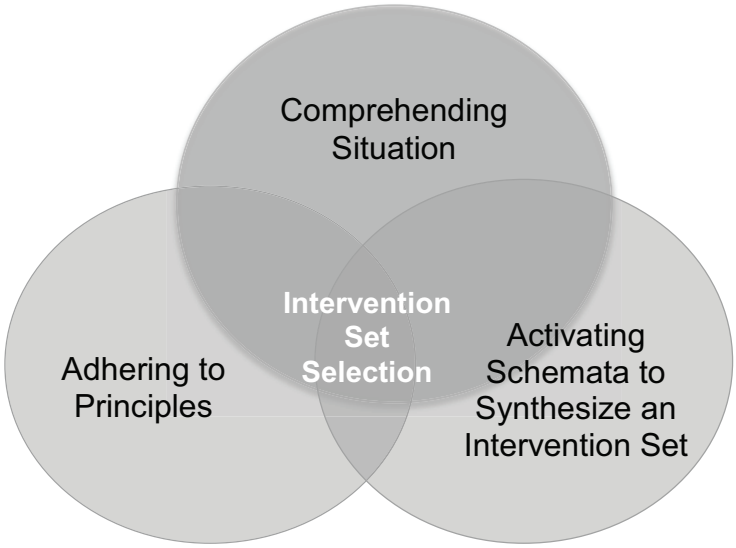

Figure 1: Intervention Set Selection Substantive Theory

Figure 1. Intervention Set Selection Substantive Theory. This figure illustrates how three components of selection work as one to generate intervention set selection.

Component 1: Comprehension of the Situation

A consultant should always be thinking of the client, results of the analysis, problems, and where it all fits into the literature base. This is seen as the first step towards the selection of an intervention set. This component sets the stage for the activation of schemata that help in synthesizing the intervention set.

Behaviors demonstrating comprehension of the situation include:

- □ Determining how the client self-diagnosed the problem
- □ Determining what home remedies the client is proposing
- □ Conducting an analysis
- □ Analyzing the performance data
- □ Recalling performance improvement literature and research to place situation into context
- □ Identify what other interventions could be connected to the interventions that were the result of the analysis

Component 2: Activating Schemata to Synthesize an Intervention Set

Schemata can be activated by the consultant at any time during the intervention selection process. This component is where the constant iteration of design and development takes place. It is also where diagramming and rapid prototyping are used to illustrate the intervention sets and their connections to sub-sets. As the consultant expands their experiences of performance improvement problems, their repertoire of retrievable schemata will grow. Schemata accommodation and assimilation allows the consultant to address more complex performance problems. The schemata that support the process of intervention set selection are listed below and are activated in combination with principles:

□ Composition Schemata	□ Enforcement Schemata
□ Directional dependence Schemata	□ Transformation Schemata
□ Mechanism of action Schemata	□ Reverberation Schemata

Component 3: Adhere to Principles

Schemata provide a way for consultants to think about intervention set selection, while the principles provide a way to manifest the schemata in the selection process. Intervention set selection principles are as followed:

- □ Prerequisite principles
- □ Initiating intervention set selection principles
- □ Permeating intervention set selection schemata principles

Prerequisite Principles
Prerequisite Principle 1. Novice consultants should begin by practicing on small performance improvement projects and by reading the work of more seasoned professionals in order to start acquiring foundational schemata. The combination of education and real world practice can vary; however, the goal is for the consultant to be well grounded in both applied research and practice. After a consultant has many years of experience and an advance degree in performance improvement, they must stay abreast of new research and additions to best practices as well as actively engage in professional associations. This is important so that experienced individuals do not become stuck in the habit of operating without incorporating new and improved methods, which in turn can render their practice stagnant.
Prerequisite Principle 2. A performance consultant must acquire expertise in all phases of the performance improvement process and have deep expertise in a particular industry or culture as well as a few interventions they have mastered. The consultant should be honest with themselves and the client about their skill level. When the consultant lacks needed expertise they should collaborate with an expert to supplement the lacking skill required for the intervention set to be executed in the organization.

Initiating Intervention Set Selection Principles
Initiating Principle 1: A performance consultant should demonstrate how the performance problem aligns with strategic goals. Establishing a connection between strategic goals and performance problems provides the consultant with an opportunity to gain and maintain the client's attention throughout the life of the project and builds creditability.
Initiating Principle 2: A performance consultant should inquire about any prior self-diagnosis activity conducted by the client to address the performance problem. In addition to analyzing the performance problem be ready to evaluate any home remedies initiated by the client.
Initiating Principle 3: A consultant must appropriately and wisely balance the use of data resulting from analysis and tacit knowledge as they navigate the intervention set selection phase of the performance improvement process. The two types of knowledge should not be viewed as dichotomies, but as counterparts working together to energize the intervention set selection phase.
Initiating Principle 4a: A consultant should act as an orchestra leader. To do this the consultant must be interconnected to people, networks, and ideas within and outside of the client organization. Consultant interconnectedness goes beyond general knowledge and awareness of these entities. Consultants should immerse themselves into these environments in order to assure that the selected intervention set ultimately fits into the current and evolving new environment. If the consultant is not interconnected they can potentially select an intervention set that quickly becomes obsolete because it does not fit within the environment. *Initiating Principle 4b:* A consultant must work across disciplines, departments, and industries to select an intervention set that is comprehensive. Cross-functionality allows an intervention set to generate support and buy-in utilizing the knowledge base from other disciplines so that the set gains traction within the organization. Cross-functionality means more than just having the right people in the room and a diverse set of ideas on the table. It involves a deeper understanding of how cross – functional intervention sets impact performance. It requires conscious and deliberate connections between ideas and people. The consultant should be viewed as a creditable connector and selector of intervention sets that need to be implemented.

Permeating Intervention Set Selection Schemata Principles

Permeating ISS Schemata Principle 1a. A systems mindset needs to permeate the intervention set selection process. The consultant should pay special attention on what binds each intervention together as a set, how the complete set works together as one unified set, and how the set functions within an organization. A systems mindset during the intervention set selection process allows the analysis to be optimized through the use of the following schemata.

- □ Composition Schemata
- □ Directional dependence Schemata
- □ Mechanism of action Schemata
- □ Enforcement Schemata
- □ Transformation Schemata
- □ Reverberation Schemata

Permeating ISS Schemata Principle 1b. Consultants should always consider the consequences of each intervention selected as a part of an intervention set. In doing so, the consultant should look at all the interventions in the set as a whole to identify how they work together and what keeps them functioning cohesively. A consultant may not know all the consequences of the set with certainty, but a concerted effort should be taken to gain knowledge about potential risks.

Permeating ISS Schemata Principle 1c. It is the responsibility of the performance consultant to inform the client of the intentional or unintentional impact the selected intervention set may have on other parts of the organization and surrounding community.

Permeating ISS Schemata Principle 2. A consultant must move beyond only gathering evidence during the needs analysis phase and gather evidence on individual interventions and sets of interventions. This evidence should be sought through a deep understanding of performance improvement published research and theory as well as through evidence acquired during practical experience and observation in the field.

Permeating ISS Schemata Principle 3a. A consultant's intuition and artistic expression should not be ignored in the quest for scientific reasoning nor should it be the sole basis for the selection of an intervention set. Intuition and artistic expression need to be done in tandem within a scientific process and grounded in evidence-based practices.

Permeating ISS Schemata Principle 3b. Avoid the cookie cutter approach. A cookie cutter approach is a figurative phrase meaning to think myopically, or to stay within the box, using a one size fits all or a standard intervention to address all performance problems. It occurs when a consultant promotes an intervention set that they are familiar with or prefer due to their expertise, instead of selecting an intervention set that uniquely addresses the performance problems of the client. Consultants should look at each intervention in the set as having a unique power to assist in reducing the performance gap.

Permeating ISS Schemata Principle 4. Intervention set modeling (ISM) is a prerequisite to prototyping and iteration because it serves a practical method to enable strategic thinking. It allows for simple modeling technique and should be used as a way to see connections and gaps among and between the interventions in the set from a macro level.
Permeating ISS Schemata Principle 5. A consultant should always listen to all feedback about an intervention set. This allows the consultant to use others as sounding boards for what will and what will not work. Too often consultants only attempt to gain buy-in at the beginning of a project and assume that the buy-in will be sustained throughout the performance improvement process. The consultant must think about when they are no longer a part of the initiative, so they should listen and be aware of critics and take notes regarding potential flaws.

Composition schemata
The first schemata that are activated are referred to as the *composition schemata*. Composition schemata aid the consultant in making a simple and yet critical decision in the intervention set selection process: that is, select a single intervention or a set of interventions. As noted, it is rare to have a single intervention as the only intervention needed to address a performance problem; however, it is an initial mistake novice or unskilled consultants make when in the intervention selection phase of the performance improvement process.

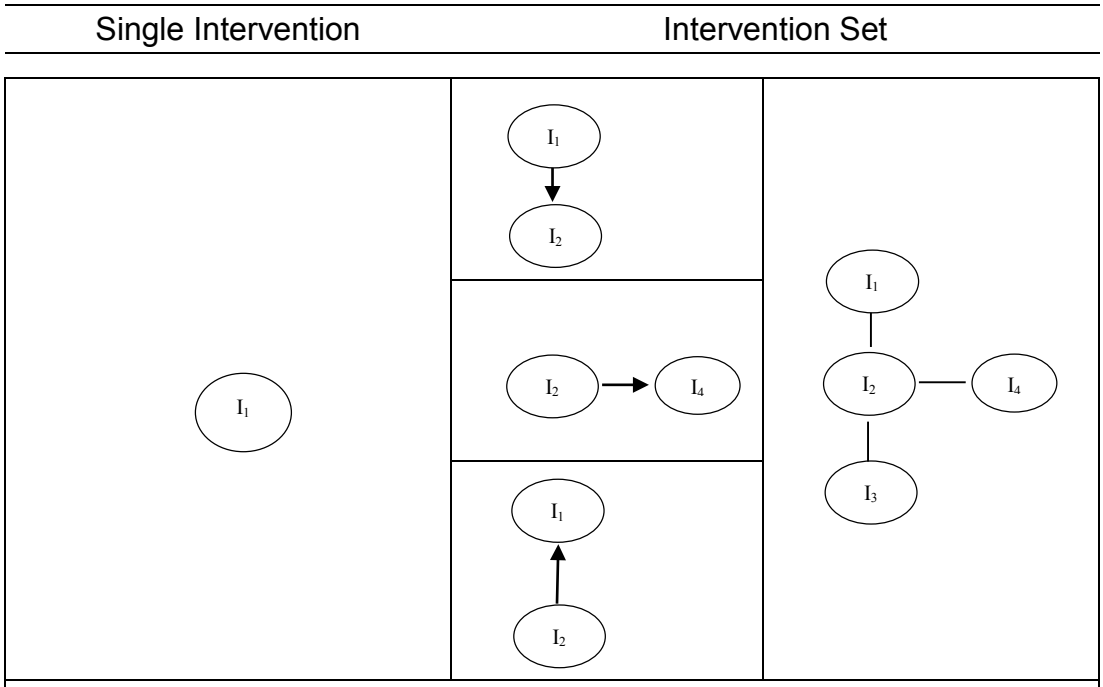

Figure 2. Composition Schemata. This figure illustrates a single interventions and intervention sets. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3. I_4 Intervention 4

Figure 2: Composition Schemata

Directional Schemata

Directional schemata guide the consultant as they explore the depth and breadth needed for each linkage in the intervention set. The dimensional set schema helps the consultant examine an intervention set's depth under a particular performance factor. While the linear set schema guides the consultant cross the span of all performance factors.

Dimensional Set	Linear (Horizontal) Set

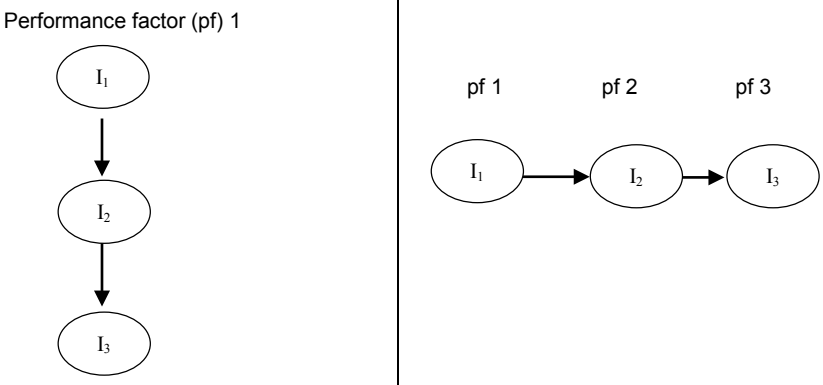

Figure 3. Directional Dependence Schemata. This figure illustrates a dimensional set and linear (horizontal) set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3. pf 1 Performance factor 1. pf 2 Performance factor 2. pf 3 Performance factor 3.

Figure 3: Directional Dependence Schema

Mechanism of action schemata
The consultant must be mindful of possible gaps in the results of an analysis. The *mechanism of action schemata* helps the consultant to see what additional interventions need to be activated in order for interventions that were the result of the analysis to be properly implemented. The intervention that serves as the mechanism of action can be located anywhere in a set and activate another intervention vertically, horizontally, or a combination of both.

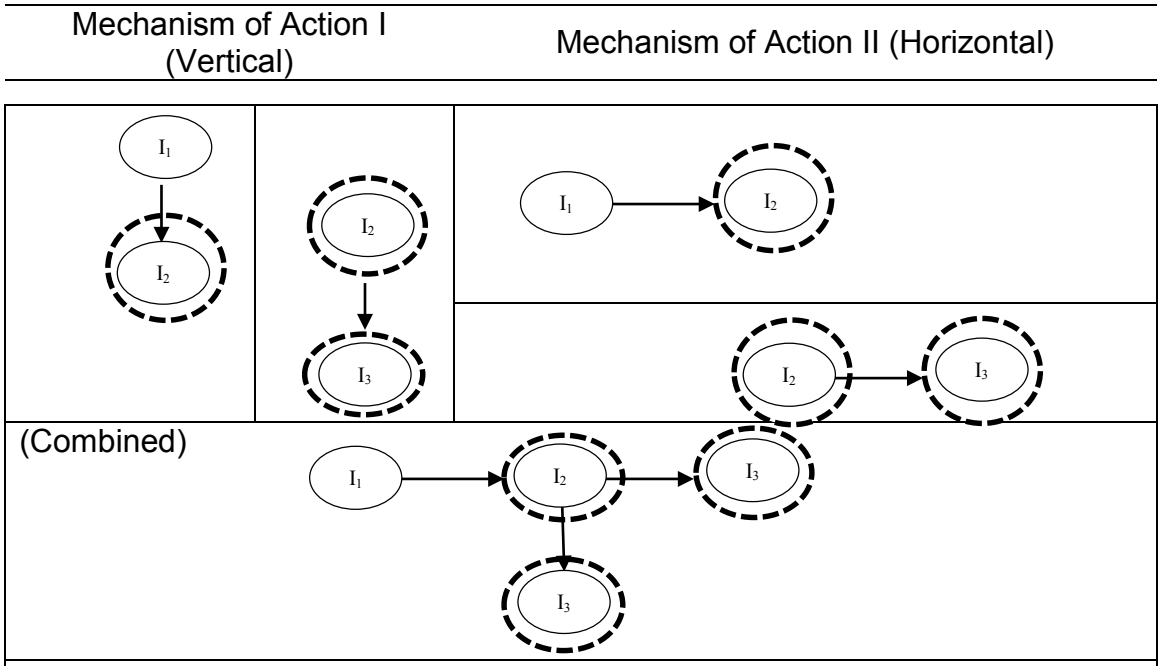

Figure 4. Mechanism of Action Schemata. This figure illustrates a vertical, a horizontal, and a set mechanism of action set. I_1 Intervention 1. I_2 Intervention 2. I_3 Intervention 3. pf1 Performance factor 1. ⬭ mechanism that activates a connection between another intervention

Figure 4: Mechanism of Action Schemata

Enforcement Schemata
The *enforcement schemata* helps the consultant decide if an intervention needs to be reinforced by another intervention. These schemata are important because they provide the consultant with checkpoint opportunities to see if the identified interventions are stable enough on their own or require enforcement. When selecting an intervention set a consultant must consider the consequences or impact of each intervention selected within the set.

One-way Enforcement Set	Two-way Enforcement Set
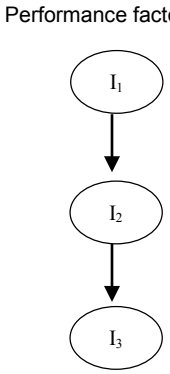	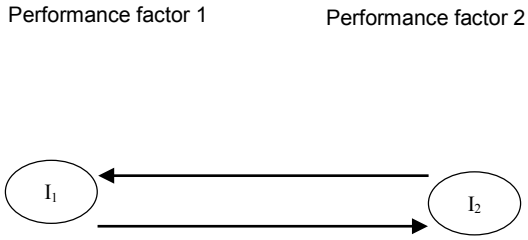
Figure 5. Enforcement Schemata. This figure illustrates a one-way and a two-way enforcement set. I_1 Intervention 1. I_2 Intervention 2. I_3 Intervention 3.	

Figure 5: Enforcement Schemata

Transformation Schemata
The *transformation schemata* enables the consultant to consider the impact or transformation power each intervention has on one another or the set as a whole.

High Transformation	Medium Transformation	Low Transformation

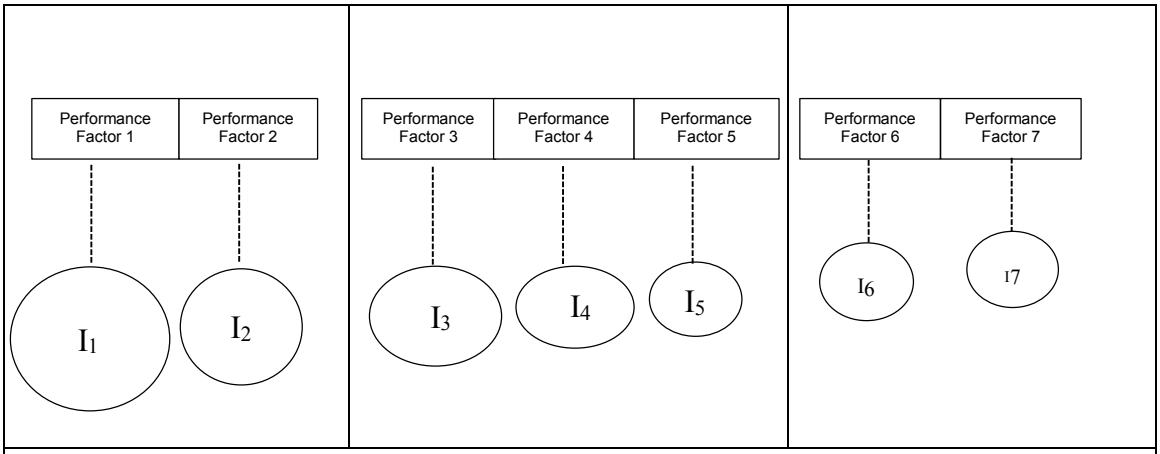

Figure 6. Transformation Schemata. This figure illustrates high, medium, and low set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3.

Figure 6: Transformation Schemata

Reverberation Schemata
Reverberation schemata provide the consultant with a quick way to think about how the intervention set as whole will impact the organization. These schemata are critical to the intervention set selection process because an intervention set can intentionally or unintentionally cause distributions in other parts of the organization.

Narrow Reverberation	Wide Reverberation
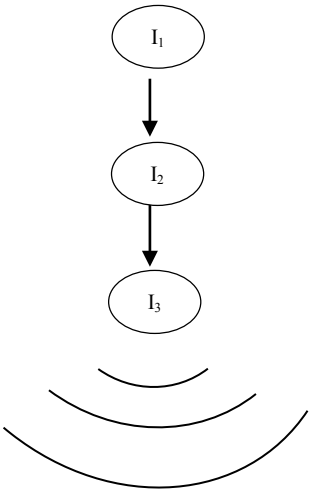	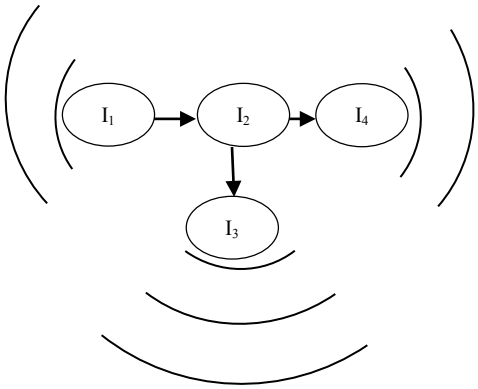
Figure 7. Reverberation Schemata. This figure illustrates a narrow and a wide reverberation set. I_1Intervention 1. I_2 Intervention 2. I_3 Intervention 3.	

Figure 7: Reverberation Schemata

APPENDIX D: DECISION RULES FOR THE INTERVENTION SET SELECTION SUBSTANTIVE THEORY CATEGORIES

In this appendix you will find the decision rules used to generate the categories for the substantive theory of intervention set selection.

1. *INTERVENTION SET SCHEMATA* - includes data regarding schemata characteristics
    1.1. *Concept of an intervention group combination* - includes data regarding more than one intervention addressing performance problems
        1.1.1. *Composition Schemata* - includes data regarding one or more than one intervention (i.e. set) in various forms
            1.1.1.1. *Directional dependence schemata* - includes data regarding the direction of linkage of the intervention set under the performance factor. Direction linkage can either linear (i.e. horizontal) or dimensional (i.e. depth)
            1.1.1.2. *Enforcement schemata* - includes data regarding the binding characteristics of a set
            1.1.1.3. *Mechanism of action schemata* - includes data regarding helps the consultant to be mindful of interventions that can be activates without being the direct result of analysis
            1.1.1.4. *Transformation schemata* - includes data regarding the impact of the intervention or the intervention set

1.1.1.5. *Reverberation schemata* - includes data regarding the intentional or unintentional disruption of an intervention or intervention set in the organization or outside the organization

2. *COMPREHEND THE SITUATION* - includes data regarding a consultant understanding the performance problem situation

2.1. *Triggers and symptoms* - includes data regarding triggers that cause the client to pay attention or symptoms that make the performance problem visible

2.1.1.1. *Seeking methods* - includes data regarding the client seeking methods to solve problem

2.1.1.1.1. *Uncertain* - includes data regarding the client being uncertain of how to solve performance problems

2.1.1.1.2. *Dispelling assumptions* - includes data regarding analysis dispelling assumptions

2.1.1.2. *Change induced* - includes data regarding a change in an organization that is induced as a result of a trigger or symptom

2.1.1.2.1. *Internal signs* - includes data regarding internal signs indicating change

2.1.1.2.2. *External triggers* - includes data regarding external triggers indicating change

2.1.1.3. *Measuring performance internally and externally* - includes data regarding measuring performance internally and externally

2.1.1.3.1. *Industry standards* - includes data regarding that identify industry standards

2.1.1.3.2. *Evaluation* - includes data regarding the use of evaluation to understand the situation.

2.1.2. *Self Diagnoses and Treatment* - includes data regarding the client attempting to self-diagnose or treat the performance problem on their own

2.1.2.1. *Openness* - includes data regarding the organization being open to change and ready to collaboration.

2.1.2.1.1. *Cross function* - includes data regarding cross function efforts being taken

2.1.2.1.2. *Culture* - includes data regarding identifying culture

2.1.2.1.3. *Support* - includes data regarding someone who is in support of change in the organization

2.1.2.1.4. *Partnership* - includes data regarding client and consultant partnership

2.1.2.2. *Awareness* - includes data regarding awareness of a problem in a general area within an organization

2.1.2.2.1. *Employee performance* - includes data regarding a problem with employee performance

2.1.2.2.2. *Process* - includes data regarding a problem with a process.

2.1.2.3. *Preconceived* - includes data regarding the formation of preconceived ideas about how to take action to solve a problem by individuals with power and position

2.1.2.3.1. *Leadership beliefs* - includes data regarding leadership beliefs about performance problem

2.1.2.3.2. *Training* - includes data regarding leadership reasoning for training solution

2.1.2.4. *Barriers* - includes data regarding barriers that are presented at various stages in the problem solving process

2.1.2.4.1. *Analysis barriers* - includes data regarding barriers involved in analysis phase of the performance improvement problem

2.1.2.4.2. *Development barriers* - includes data regarding barriers involved in development phase of the performance improvement problem

2.1.2.4.3. *Implementation issues* - includes data regarding issues with the implementations phase of the performance improvement problem

2.1.3. *Data Driven* - includes data regarding evidence identification of performance problem

2.1.3.1. *Research methods* - includes data regarding use of research method elements to understand root causes of problem

2.1.3.1.1. *Findings* - includes data regarding analysis findings

2.1.3.1.2. *Questions* - includes data regarding needs analysis questions

2.1.3.1.3. *Sampling* - includes data regarding sampling

2.1.3.1.4. *Analysis method* - includes data regarding a method for analyzing the problem

2.1.3.1.5. *Data* - includes data regarding data driven analysis

2.1.3.1.6. *Data source* - includes data regarding the identification of a analysis data source

2.1.3.1.7. *Objective* - includes data regarding objectivity in the data analysis

2.1.4. *Interconnectedness* - includes data regarding interventions that are connected to get other in some way

2.1.4.1. *Skill and knowledge factors* - includes data regarding various types of skill and knowledge factors can be a part of an overall problem

2.1.4.1.1. *Skills* - includes data regarding the selection of a skill as an intervention

2.1.4.1.2. *Knowledge* - includes data regarding the selection of knowledge as an intervention

2.1.4.2. *Incentive factors* - includes data regarding the selection of a various types of incentive factors can be a part of an overall problem

2.1.4.2.1. *Recognition/Rewards* - includes data regarding the selection of a recognition or rewards as an intervention

2.1.4.2.2. *Critique of instructor* - includes data regarding the selection of an evaluation of the instructor as an intervention

2.1.4.2.3. *Measurement of performance* - includes data regarding the selection of a measures of performance as an intervention

2.1.4.2.4. *Measures* - includes data regarding the selection of an organization key performance indicators as an intervention

2.1.4.2.5. *Evaluation* - includes data regarding the selection of some type of evaluation as an intervention

2.1.4.2.6. *Feedback* - includes data regarding the selection of a feedback mechanism as an intervention

2.1.4.2.7. *Goals/objectives* - includes data regarding the selection of a performance goals or objectives as an intervention

2.1.4.2.8. *Reporting* - includes data regarding the selection of a some type of reporting mechanism as an intervention

2.1.4.2.9. *Standards* - includes data regarding the selection of a performance standard as an intervention.

2.1.4.2.10. *Penalties* - includes data regarding the identification of penalties

2.1.4.2.11. *Encouragement* - includes data regarding the selection of a encouragement mechanism as an intervention

2.1.4.2.12. *Compensation* - includes data regarding the selection of compensation as an intervention

2.1.4.3. *Organizational system factors* - includes data regarding various types of organizational system factors can be a part of an overall problem

2.1.4.3.1. *New process* - includes data regarding the selection of a new process as an intervention

2.1.4.3.2. *New procedure* - includes data regarding the selection of a new procedure as an intervention

2.1.4.3.3. *Redesign of procedure* - includes data regarding the selection of a redesign of procedures as an intervention

2.1.4.3.4. *System* - includes data regarding the selection of a new system as an intervention

2.1.4.3.5. *New leadership* - includes data regarding the selection of a new leader as an intervention

2.1.4.3.6. *Program change* - includes data regarding the selection of a program change as an intervention

2.1.4.3.7. *Mission* - includes data regarding the selection of a mission as an intervention

2.1.4.3.8. *Standards* - includes data regarding the selection of an organizational standard as an intervention

2.1.4.3.9. *Information* - includes data regarding the selection of a new information as an intervention

2.1.4.3.10. *Values* - includes data regarding the selection of new values as an intervention

2.1.4.3.11. *Strategic goals* - includes data regarding the selection of strategic goals as an intervention

3. *PRINCIPLES* - includes memos regarding the following principles

3.1. Gaining the client's attention

3.2. Client self-diagnoses and home remedy

3.3. Data and tacit knowledge work together

3.4. Interconnectedness

3.5. Intervention set systems perspective

3.6. Select an evidence based intervention set

3.7. Acquire subject matter expertise and when lacking seek collaboration

3.8. Seek internal and external cross-functionality

3.9. Intervention set modeling (ISM) a prerequisite to prototyping and iteration

3.10. Balance art, science, and intuition

3.11. Avoid the cookie cutter approach

3.12. Acquire practical experience

3.13. Know the consequence of each intervention and reflect on the set

3.14. Understand the impact of the set

3.15. Be open to continuous feedback

APPENDIX E: OUTLINE OF THE THEORETICAL CATEGORIES AND CODES THAT CONTRIBUTED TO THE SUBSTANTIVE THEORY

In this appendix you will find an outline of the theoretical categories and codes that were generated and led to the substantive theory of intervention set selection.

1. Intervention set schemata
    1.1. Concept of an intervention group combination
        1.1.1. Composition schemata
            1.1.1.1. Directional dependence schemata
            1.1.1.2. Enforcement schemata
            1.1.1.3. Mechanism of action schemata
            1.1.1.4. Reverberation schemata
            1.1.1.5. Transformation schemata
2. Comprehend the situation
    2.1. Triggers and symptoms annotations
        2.1.1.1. Seeking methods to solve a problem
            2.1.1.1.1. Client uncertain of how to solve problem
            2.1.1.1.2. Analysis dispelling assumptions
        2.1.1.2. Change in an organization is induced by a trigger or symptom
            2.1.1.2.1. Internal signs indicating change
            2.1.1.2.2. External triggers indicating change
        2.1.1.3. Measuring performance internally and externally
            2.1.1.3.1. Industry standards
            2.1.1.3.2. Evaluation
    2.1.2. Self diagnoses and treatment
        2.1.2.1. Sense of openness to change and collaboration
            2.1.2.1.1. Cross function effort
            2.1.2.1.2. Culture
            2.1.2.1.3. Support for change
            2.1.2.1.4. Client and consultant partnership
        2.1.2.2. Awareness of a problem in a general area within an organization
            2.1.2.2.1. Problem with employee performance
            2.1.2.2.2. Problem with process
        2.1.2.3. Formation of preconceived ideas about how to take action to solve a problem by individuals with power and position
            2.1.2.3.1. Leadership beliefs about problem
            2.1.2.3.2. Leadership reasoning for training
        2.1.2.4. Barriers are present at various stages in the problem solving process
            2.1.2.4.1. Barriers involved in analysis
            2.1.2.4.2. Barriers involved in development
            2.1.2.4.3. Issues with implementations
    2.1.3. Data driven
        2.1.3.1. Use of research methodology elements to understand root causes of problem
            2.1.3.1.1. Findings
            2.1.3.1.2. Needs analysis questions
            2.1.3.1.3. Sampling

2.1.3.1.4. Analysis methodology
2.1.3.1.5. Data driven analysis
2.1.3.1.6. Data source
2.1.3.1.7. Objective data analysis

2.1.4. Interventions interconnectedness

2.1.4.1. Various types of skill and knowledge factors can be a part of an overall problem

2.1.4.1.1. Skills
2.1.4.1.2. Knowledge

2.1.4.2. Various types of incentive factors can be a part of an overall problem

2.1.4.2.1. Recognition and rewards
2.1.4.2.2. Measurement of performance
2.1.4.2.3. Measures
2.1.4.2.4. Evaluation
2.1.4.2.5. Feedback
2.1.4.2.6. Performance goals and objectives
2.1.4.2.7. Reporting
2.1.4.2.8. Performance standards
2.1.4.2.9. Penalties
2.1.4.2.10. Encouragement
2.1.4.2.11. Compensation

2.1.4.3. Various types of organizational system factors can be a part of an overall problem

2.1.4.3.1. New process
2.1.4.3.2. New procedure
2.1.4.3.3. Redesign of procedure
2.1.4.3.4. System
2.1.4.3.5. New leadership
2.1.4.3.6. Program change
2.1.4.3.7. Mission
2.1.4.3.8. Standards
2.1.4.3.9. Information
2.1.4.3.10. Values
2.1.4.3.11. Strategic goals

3. Principles

3.1.1. Gaining the client's attention
3.1.2. Client self-diagnoses and home remedy
3.1.3. Data and tacit knowledge work together
3.1.4. Interconnectedness
3.1.5. Intervention set systems perspective
3.1.6. Select an evidence based intervention set
3.1.7. Acquire subject matter expertise and when lacking seek collaboration
3.1.8. Seek internal and external cross-functionality
3.1.9. Intervention set modeling (ISM) a prerequisite to prototyping and iteration
3.1.10. Balance art, science, and intuition
3.1.11. Avoid the cookie cutter approach
3.1.12. Acquire practical experience
3.1.13. Know the consequence of each intervention and reflect on the set
3.1.14. Understand the impact of the set
3.1.15. Be open to continuous feedback

APPENDIX F: EXCERPTS FROM THE MEMO LOG

In this appendix you will find a sample of excerpts from the memos generated throughout the study. The entries cover the timeframe from April 2010 to January 2015.

January 2010

Human Performance Technology (HPT) references models. However, schema or schemata (plural) are more conceptual than models. Schemata provide more flexibility in thinking than model. (Memo Trigger: Conversation with Dr. Pershing)

February 2010

Principles provides guides for practitioners not rules. (Memo Trigger: Conversation with Dr. Bichelmeyer)

May 2010

Received IRB approval this month. Very excited. (Memo Trigger: Approval Process)

June 2010

How are interventions composed? Single vs. multiple. (Memo Trigger: Initial reading of cases and reflections)

June 2010

We need to teach the process of intervention selection with more detail and clarity so novice can understand it. However, there is not enough knowledge to support instruction. (Memo Trigger: Reflecting on HPT graduate curriculum)

July 2010

Each case has a different context or situation suggesting each approach to reducing the performance gap is not generic. (Memo Trigger: Reflecting on a few of the cases as a whole)

August 2010

Systems thinking and diffusion of effect are core idea in intervention selection. (Memo Trigger: Conversions with Dr. Pershing and reflecting on HPT graduate studies)

September 2010

Malcolm Gladwell's book Outliners provides insight into how much time is needed to be considered an expert. (Memo Trigger: Reading Gladwell's book)

12 June 2011

If individuals do not know what they need to initially do in a performance improvement initiative, models can sometimes guide individuals in the wrong direction. For example, the PAT Model (Sleezer, 2000) is directed toward identifying the organization's performance needs that can be addressed with training. Case #10. Sometimes the selection of a model can significantly alter the outcome of an intervention set. (Memo Trigger: Case #10)

12 June 2011

Data gathering is not only important for understanding the performance problem and selecting the correct intervention set, but it is a way one knows that the performance gap was closed due to the intervention set selected. (Memo Trigger: Case #9

12 June 2011

Regulation can force training as a solution. (Memo Trigger: Case #5, #11, #12)

12 June 2011

Regardless of the model, the context and situation must always be considered when addressing performance problems. (Memo Trigger: Accumulation of Cases)

19 June 2011

The gathering of performance measures without a feedback system does not enable performance improvement. It simply tracks performance trends and does not enable change or corrective action. Change occurs when one knows what to do with the measures collected. Simply reporting results or tracking progress does not improve performance. There is more to it. (Memo Trigger: Case #12)

26 June 2011

In order to implement a system, other less noticeable but critical interventions are needed to be a part of a set. For example, in a case that focused on recognition other interventions were needed to implement the main intervention. (Memo Trigger: Case #13)

4 September 2011

What are intervention selection strategies? (Memo Trigger: Accumulation of Cases)

4 September 2011

Performance problems can be multi-layer. (Memo Trigger: Case #5)

5 September 2011

Interventions may not be aligned one-to-one with the analysis. It may take an additional intervention to implement a more dominant intervention. For example, implementing a new communication strategy. This may include implementing a bulletin board or newsletter to serve as medium for communications to take place. (Memo Trigger: Case #1, #3, #22)

5 September 2011

Unit of analysis can be unclear in the beginning. Understanding the unit of analysis is just as important as defining the performance problem. Identifying the unit of analysis is a part of the articulating the performance problem. (Memo Trigger: Accumulation of Cases)

8 September 2011

The consultant needs to educate throughout the process and identify needs. (Memo Trigger: Accumulation of Cases)

8 September 2011

The unit of analysis is critical to intervention selection because it makes a difference on what type of selection strategy you choose to focus on during implementation. (Memo Trigger: Accumulation of Cases)

8 September 2011

Quantitative measures are important for clarity of results in a business. Qualitative data is not easy to present nor are the results clearly visible. (Memo Trigger: Accumulation of Cases)

25 September 2011

Multiple problems means require multiple solutions. There is NO magic bullet. Understanding the amount and complexity of the problem is critical. (Memo Trigger: Accumulation of Cases)

16 October 2011

Problems can generalized or organized in a taxonomy. A solution has to embody the problem in its context. (Memo Trigger: Accumulation of Cases)

23 October 2011

Build on others work (Wile & Gilmore). Wile's work needs to be expanded on. (Memo Trigger: HPT Literature Review)

30 October 2011

Identify what the intervention set trying to reinforce. And why? Why is it important? This is a principle. (Memo Trigger: Accumulation of Cases)

13 November 2011

There is some sort of feedback loop within the intervention set. (Memo Trigger: Accumulation of Cases)

4 December 2011

There is a principle related to feedback, since feedback is central to getting results. (Memo Trigger: Accumulation of Cases)

4 December 2011

The case by Finnegan had two great points. The first focuses on the role of consequences as it relates to results. The second point emphasizes knowing the business. (Memo Trigger: Case #5)

10 December 2011

To select an intervention you need to know why the problem exists. (Memo Trigger: Accumulation of Cases)

11 December 2011

Someone was watching, observing, accountable for results, or cared. This was realized in case 5. (Memo Trigger: Case #5)

13 December 2011

There is collaboration process visible in the intervention selection process through case #8. The selection process is a combined effort, not simply the consultant telling the client what to do. Together they should walk and think through it together. The consultant listens to the client then drafts ideas. Not a linear process; it is iterative as they think through how it will work in their system and context. This is important for buy in and implementation. Case #8 provides an example of a collaborative intervention creation session between client and consultant. (Memo Trigger: Case #8)

18 December 2011

Analysis questions are the critical component of interventions selection because they frame the thinking about the possibilities of interventions. Realized in Case #8. The analysis is a collaborative task. The answers from analysis lead the way for the interventions. Listening to the client is critical to widening the intervention possibilities. Collaboration truly is a two way street, even if the consultant is being paid by the client. (Memo Trigger: Accumulation of Cases)

18 December 2011

There is a connection between tools, processes, and procedures. Tools tend to generate processes and procedures. The connections between these interventions reoccur. (Memo Trigger: Accumulation of Cases)

14 January 2012

Is a needs assessment an intervention if an organization originally wanted to only conduct training? Hmmmmm… (Memo Trigger: Accumulation of Cases)

22 January 2012

A few ideas on possible principles 1) System view is created by drawing a diagram of the intervention set 2) Participative selection of set and 3) Intervention set selection sets the parameters for design. (Memo Trigger: Accumulation of Cases)

22 January 2012

I am thinking about the shape of schemata. Schemata should focus on the impact of other interventions, that is, interventions working together to support the root cause of the problem. Root cause is revealed through analysis. Analysis is out of scope for this study. (Memo Trigger: Accumulation of Cases)

26 February 2012

Do you have to know the WHY before you select an intervention set? Yes, this is where knowing the performance literature is critical. Knowledge of the literature allows for a more comprehensive intervention set and adds value for the client. Answering the question as to why, allows you to consider more things when you are analyzing and making connections. The difference is in how you solve the problem. (Memo Trigger: Accumulation of Cases)

10 June 2012

A request for proposal (RFP) identifies what the intervention set needs to consist of instead of being generated from the need assessment conducted by the consulting company. (Memo Trigger: Case)
#11)

10 June 2012

Essential to understanding the problem is to know the triggers and or symptoms of the problems. (Memo Trigger: Accumulation of Cases)

10 June 2012

Understanding the triggers allow the consultant to scope the performance problem. Case #11 is an example, there are multiple layers of triggers that led the consultant closer to understanding the scope of the performance problem. (Memo Trigger: Case #11)

June 2012

The findings from a needs assessment informs the detail of the performance problem. The more detailed a performance problem, the more detailed and robust the intervention set. A needs assessment should accompany the intervention set. It should be conducted by the same consultant team to ensure it is implemented the way it was intended and that the problem is fully

understood by those implementing the set. (Memo Trigger: Accumulation of Cases)

June 2012

A combination of problems leads one to think there is a combination of solutions. It is not only important to know what the performance problem is, but to understand how the components influence and trigger the performance problem. Understanding the components of the problem helps in understanding the set of interventions for the overall performance problem. (Memo Trigger: Accumulation of Cases)

June 2012

Visual representations of interventions enables one to see the connection between each and see the set. This is difficult to do by simply coding text. I am going to work on sketching the intervention sets as model from this point to see connections. (Memo Trigger: Accumulation of Cases)

21 October 2012

IDEA: Principle – the performance problem needs to be clearly defined as a result of the analysis because it will give you many results that seem not to fit into an overall performance gap. You do not want your interventions to be disjointed. (Memo Trigger: Accumulation of Cases)

March 2013

It is important to note that there are risks and concerns with the use of schemata, if used inappropriately. Schemata can help or hinder innovation. It depends on how it is use. Principles help to mitigate the risk to stifling innovation. (Memo Trigger: Reflecting on schemata)

April 2013

Principles are conventions or guides that define how to conduct performance improvement. (Memo Trigger: Reflecting on principles)

March 2013

Principles should be embraced by practitioners not forced on them as a law. They should be introduced early in a practitioner's career. (Memo Trigger: Reflecting on principles)

June 2013

Intervention sets can depend on interventions within and across the same performance factor. (Memo Trigger: Reflecting on performance factors)

August 2013

Interventions have mechanism that trigger action. The trigger can be within the same performance factor or across a performance. (Memo Trigger: Modeling or diagramming intervention sets)

January 2014

Interventions within a set can enforce one another. (Memo Trigger: Modeling or diagramming intervention sets)

April 2014

Some intervention have high and low transformation power. (Memo Trigger: Modeling or diagramming intervention sets)

June 2014

Intervention sets can have impacts bigger than the individual interventions within the set. (Memo Trigger: Modeling or diagramming intervention sets)

July 2014

I need a simple graphic to explain the substantive theory of intervention set selection. (Memo Trigger: Reflecting on how to represent the substantive theory of intervention set selection)

September 2015

The substantive theory of intervention set selection consist of principles and schemata working together. (Memo Trigger: Reflecting on findings while on maternity leave).

August 2014

Going to the doctor allows me to see similarities between performance consultants and physicians. Similarities such as diagnosing, selecting an array of treatments based on knowledge and experience. (Memo Trigger: Reflecting on findings while on maternity leave and update meeting with Dr. Pershing)

January 2015

There needs to be more documented case studies focuses on intervention set selection, so others can learn and further research can be conducted. (Memo Trigger: Reflecting on the research process and publishing a case study for the performance improvement casebook)

January 2015

My dissertation will be coining or establishing the term intervention set selection in the literature. I need to explain why this is important in the implications chapter. (Memo Trigger: Reflecting on the implications of the study)

APPENDIX G: IRB FORM

INDIANA UNIVERSITY

OFFICE OF RESEARCH ADMINISTRATION

To: Simone Symonette
Instructional Systems Technology

From: IUB Human Subjects Office
Office of Research Administration – Indiana University

Date: April 19, 2010

RE: **EXEMPTION GRANTED – NEW PROTOCOL**
Protocol Title: Developing a Schema & Principles for Intervention Set Selection in Human Performance Technology
Protocol #: 1004001252
Sponsor: N/A

Your study named above was accepted on APR 15, 2010 as meeting the criteria of exempt research as described in the Federal regulations at 45 CFR 46.101(b), paragraph(s) 4. This approval does not replace any departmental or other approvals that may be required.

As the principal investigator (or faculty sponsor in the case of a student protocol) of this study, you assume the following responsibilities:

- Changes to Study: Any proposed changes to the research must be approved by the IRB prior to implementation. To request approval, please complete an Amendment form and submit it, along with any revised study documents to iub_hsc@indiana.edu. Only after approval has been granted by the IRB can these changes be implemented.

- Completion: Although a continuing review is not required for an exempt study, you are required to notify the IRB when this project is completed. In some cases, you will receive a request for current project status from our office. If we are unsuccessful in our attempts to confirm the status of the project, we will consider the project closed. It is your responsibility to inform us of any changes to your contact information to ensure our records are kept current.

Per federal regulations, there is no requirement for the use of an informed consent document or study information sheet for exempt research, although one may be used if it is felt to be appropriate for the research being conducted. As such, these documents do not include an IRB-approval stamp. Please note, however, that if a study information sheet and/or informed consent document is to be used, you should use unstamped accepted versions. **Please note that your study has been accepted without the use of a study information sheet / informed consent document.**

You should retain a copy of this letter and any associated approved study documents in your records. Please refer to the protocol title and number in future correspondence with our office. You may contact our office at (812) 855-3067 or by e-mail at iub_hsc@indiana.edu if you have questions or need further assistance.

Thank you.

CURRICULUM VITAE

Simone Gia Symonette
simone.symonette@gmail.com

EDUCATION

Doctor of Philosophy **2015**
Instructional Systems Technology, Indiana University, Bloomington, Indiana
Dissertation: Developing Principles and Schemata for Intervention Set Selection in Human Performance Technology
Advisor: James A. Pershing

Master of Public Administration **2006**
University of Central Florida, Orlando, Florida

Bachelor of Arts International Studies/Affairs **2002**
Bethune-Cookman College, Daytona Beach, Florida

AWARDS & HONORS

- Indiana University President's Diversity Doctoral Scholars Program, Dissertation Award (2014-2015)
- Eli Lilly US Sales Training, Center for Innovative Learning Discipline Award (2014)
- Pi Lambda Theta, National Honor Society (2012)
- First Place, International Society for Performance Improvement Case Competition (2009)
- University Graduate School Scholars Fellowship at Indiana University (2006)
- Magna Cum Laude, Bethune-Cookman College (2002)
- Division of Social Sciences Academic Excellence Award, Bethune-Cookman College (2002)
- Dean's Student Leader Recognition, Bethune-Cookman College (2002)
- Bethune-Cookman College Academic Dean's List (1999 – 2002)
- Lilly Foundation Endowment (1999, 2000)
- L.P Whitehead Scholarship (2000)

PROFESSIONAL EXPERIENCES

Performance Consultant & Learning Strategist **2012 – Present**
Eli Lilly Center for Innovative Learning (CIL)

- Launching two autoimmune products for the learning strategy team (2015)

Previous Accomplishments

- Launched two diabetes products for the learning strategy team through the development of on-time and on-budget sales training modules (2014)
- Launched a oncology product for the learning strategy team through the development of on-time and on-budget global medical and marketing training modules (2013)
- Analyzed the needs of sales representatives in initial development training resulting in recommendation for program redesign
- Worked on the core team to redesign sales training to produce the Lilly Sales University, specific contribution included the design, development,

implementation of learner assessment such as customer interaction simulations and proctored exams
- Designed, developed, and implemented the national and area post meeting measurement system across all business units
- Managed the sales training feedback system and support special project with data and measurement resources

Instructional Designer/Performance Consultant **2010 - 2012**
Eli Lilly Sales Learning & Leadership Development (SLLD)/ General Physics
- Redesigned, developed, and implemented the Sales Learning & Leadership Development (SLLD) feedback system which resulted in:
  - Multiple business units gaining access to training evaluation data
  - Reporting post learning events data
  - 1st time SLLD receiving data to improve Post-Home learning events
  - Increased evaluation response rate by more than 50%
  - Design data dashboard for learner satisfaction
  - Instructional Systems Design consulting feedback strategy
- Served as the Oncology and Cardio Sales Training Instructional Designer which resulted in the creation of facilitator guides for products and 2011 National Sales Meeting

Instructional Designer & Program Research Consultant **2009 – 2010**
Indiana University Campus Recreational Sports
- Designed and developed risk management instructional modules which resulted in the effective and consistent training of approximately 300 employees
- Analyzed, redesigned, and developed the risk management accident report documentation which resulted in a more efficient and comprehensive accident reporting system
- Developed employee surveys which resulted in gathering data for the improvement of various risk management processes and protocols

Associate Instructor W401 Integrating Technology in Teaching **2007 – 2009**
Indiana University School of Education
- Manage 37 to 76 students in a blended learning environment using the Oncourse Learning Management System (80% Online/ 20% traditional classroom)
- Analyzed students learning needs
- Design and development instructional materials which resulted in an average student evaluation of 3.6 on a 4.0 scale rating my use of teaching methods well suited to the course
- Provide students with feedback on course deliverables which resulted in an average student evaluation of 3.7 on a 4.0 scale rating my availability for regular consultation
- Provided students with an inspiring and challenging learning experience which resulted in an average student evaluation of 3.6 on a 4.0 scale rating me as an outstanding instructor

Evaluation Consultant Active Pharmaceutical Ingredient Pilot Training 2007
Eli Lilly and Company (Evaluation Project)
- Developed evaluation survey instruments
- Observed two training session at the Eli Lilly MQ Learning Center in Indianapolis

- Organize and conduct focus groups with learners, subject matter experts, and instructors
- Analyzed survey data
- Presented evaluation findings and recommendations to Eli Lilly's representatives which resulted in ongoing training improvement efforts

Corporate & Foundation Development Officer **2004 –2006**
Bethune-Cookman College

- Managed & coordinated corporate and foundation fundraising program
- Increased corporate giving contributions by 80% & foundation giving by 187% in one year
- Grant and proposal writing
- Designed and organized fundraising literature which resulted in donors friendly documentation
- Reported unrestricted funding to the United Negro College Fund
- Coordinate the Annual Spring Concert which generated over 1500 attendees
- Serve as the liaison for two community volunteer organizations which resulted in continuous community networks within the private, public, and non-profit sector

Donor Acquisition Development Officer **2004**
Bethune-Cookman College

- Managed faculty and staff giving program, increasing contributions by 62.50% in a year
- Collaborated with the development team which resulted in raising over $400,000 in 6 months
- Wrote a grant for the restoration of Mary McLeod Bethune home which resulted in a $300,000 grant awarded

College Advancement Intern **2004**
Bethune-Cookman College

- Apprentice for Senior Development Officers in planning and organizing activities
- Grant writing and proposal development
- Solicited new donors for the institution which resulted in earning a position as a Development Officer

Pre-Kindergarten Teacher **2003**
St. Timothy Episcopal Church

- Developed curriculum
- Assessed performance on course material
- Conducted learning activities

Supplemental Instructor **2002 – 2003**
Bethune-Cookman College

- Assisted students with the language statistics as a discipline
- Integrated statistics lectures and readings to develop effective study aides for students
- Managed & coordinated supplemental study sessions for social science statistics courses

Residential Assistant Living & Learning Center **2000 – 2001**
Bethune-Cookman College

- Maintained cleanliness and order in dormitory
- Managed disputes between students
- Conducted health and time management programs with students

Sales Coach **2000 – 2001**
SAC Tele-Performance

- Ensured Customer Service and satisfaction was the main focus of employees
- Increased overall efficiency by ensuring a time-focused employee base
- Guaranteed proper communication between management and employees
- Increased overall employee moral by participating in the employee recognition process

Sales Associate **1998 – 2002**
Rack Room Shoes

- Increased the overall sales volume by 25%
- Ensured merchandise presentations adhered to company standards
- Directed new employee training program

PUBLICATIONS

Symonette, S. G. (2015). Performance Improvement of a Sales Training Feedback System. In J. Stefaniak (Ed.) *Cases on Human Performance Improvement Technologies*. IGI Global.

Symonette, S. G., & Geary, C. (2013). Performance improvement of risk management accident reporting. *Performance Improvement*, 52 (10)

Brush, T., Saye, J., Kale, U., Won Hur, J., Kohlmeier, J., Yerasimou, T., Guo, L., & **Symonette, S. G.** (2009). Evaluation of the Persistent Issues in History Laboratory for Virtual Field Experience (PIH-LVFE). *Journal of Interactive Online Learning*. Retrieved from http://www.ncolr.org/issues/jiol/v8/n1/evaluation-of-the-persistent-issues-in-history-laboratory-for-virtual-field-experience-pih-lvfe#.VUl67PlVhBc.

Pershing, J. A., Abaci, S., **Symonette, S.,** & Brunclik, C. (2008, May). ISPI's 2008 practice and job analysis. *PerformanceXpress, May 2008.* Retrieved from http://performancexpress.org/0805/

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, June). ISPI's 2008 practice and job task analysis survey: Part two. *PerformanceXpress, June 2008.*Retrieved from http://performancexpress.org/0806/

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, July). ISPI's 2008 practice and job task analysis survey: Part three. *PerformanceXpress, July 2008.* Retrieved from http://performancexpress.org/0807/

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, August). ISPI's 2008 practice and job task analysis survey: Part 4 of 5. *PerformanceXpress, August 2008.* Retrieved from http://performancexpress.org/0808/

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, September). ISPI's 2008 practice and job task analysis survey: Part 5 of 6. *PerformanceXpress, September 2008.* Retrieved from http://performancexpress.org/0809/

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, October). ISPI's 2008 practice and job task analysis survey: Part 6 of 6. *PerformanceXpress, October 2008.* Retrieved from http://performancexpress.org/0810/

PRESENTATIONS

Presenter, Purdue University. EDCI 528 Human Performance Technology (2015)

Symonette, S. G. (2014). *Performance Improvement of Risk Management Accident Reporting.* Presentation at the 2014 Performance Improvement Conference of the International Society for Performance Improvement, Indianapolis, IN.

Indiana University IST Conference Panelist Dialogue focused on mobile learning (2013)

Co-Presenter, Eli Lilly Global Learning & Development Conference

- Virtual Facilitation Workshop (2013)
- Consulting on the Inside Workshop (2012)

Guest Co-presenter, Capital Normal University 首都师范大学, Job task analysis case (2012)

Symonette, S (2012). *Intervention Selection Inquiry Instruction, and Consulting.* Presentation at the 2012 Performance Improvement Conference of the International Society for Performance Improvement, Toronto, Canada.

Symonette, S., (2010). *The Value of Microteaching as an Instructional Method for Integrating Technology into Teaching Courses*. Presentation at the 2010 Annual IST Conference, Bloomington, IN.

Abaci, S., Farouk, S., Kang, S. P., & **Symonette, S.** (2009, April). *S-Curve team presentation for 2009 ISPI case competition.* Presentation at the 2009 Performance Improvement Conference of the International Society for Performance Improvement, Orlando, FL.

Pershing, J. A., Abaci, S., **Symonette, S.**, and others (2009, April). *A review and assessment of the ISPI certified performance technologist standards and certification process.* Presentation at the 2009 Performance Improvement Conference of the International Society for Performance Improvement, Orlando, FL.

Symonette, S. & Abaci, S. (2009, April). *Common issues and improvements of needs and cause analysis standards*. Presentation at the 2009 Performance Improvement Conference of the International Society for Performance Improvement, Orlando, FL.

Symonette, S., Farouk, S., Kang, P., Abaci, S., and others (2009, March). *ISPI case study competition: Needs analysis plan for a performance problem*. Presentation at the 2009 Annual IST Conference, Bloomington, IN.

Pershing, J. A., Abaci, S., **Symonette, S.**, & Brunclik, C. (2008, April). *Certified Performance Technology (CPT): Setting the Standard.* Presentation at the 2008 Performance Improvement Conference of the International Society for Performance Improvement, New York, NY.

Guo, L & **Symonette, S.** (2007). *Usability testing of a video-based database for pre-service teachers*. Presentation at the 2007 Annual IST Conference, Bloomington, IN.

SCHOLARLY ACTIVITIES

Institute on Teaching and Mentoring
Atlanta, GA, 2014

- Participated in workshops focused on mentoring and teaching preparation

University of California, Los Angeles Summer Humanities Research Program
Los Angeles, CA, Summer 2003

- Conducted research on the American Prison Industrial Complex.
- Attended graduate preparatory seminars concentrated in African American Studies emphasizing literature, history, art, culture and the criminal justice system.

Howard University Summer Institute of the Charles B. Rangel International Affairs Program
Ralph J. Bunche Center, Washington, DC. Summer 2002

- Explored the ways international economic factors effect political outcomes.
- Examined American Foreign policy, economics, and social relations with foreign institutions.

Florida Agriculture & Mechanical University Foreign Exchange Program.
Pontificia Universidad Catolica Madre y Maestra Republica Dominicana, Dominican Republic. August 2001 – December 2001

- Foreign exchange student.
- Guest of a host family.

SERVICE ACTIVITIES AND MEMBERSHIPS

- Judge for the ISPI HPT Case Competition (2014)
- Committee Representative for the Indiana University Instructional Systems Technology Department Chair review (2010)
- American Red Cross, First Responder Certified (2009)
- Submission review committee member & volunteer at the IU IST Conference (2007)
- Member, International Society for Performance Improvement
- Member, Public Relations Association (2005)
- Young Women Scholastic Program (2003)
- President of St. Timothy's Episcopal Church Youth Group (2002-2003)
- Alpha Kappa Alpha Sorority, Incorporated (Member; 2000)
- National Model United Nations Representative, New York (2000)
- Organization of African United Conference, Washington DC (1999)
- Florida/Georgia Louis Stokes Alliance for Minority Participation (Member, 1998)
- Presidential Classroom Alumni (Member, 1997)